= ACCOMPLISHMENTS =

SOIL AND MOISTURE CONSERVATION OPERATIONS IN GRAZING DISTRICTS

1935 - 1948

THE SYMPTOM

THE CURE

BUREAU OF LAND MANAGEMENT

= UNITED STATES =

DEPARTMENT OF THE INTERIOR

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MARION CLAWSON, DIRECTOR

Division of Range Management
G. M. Kerr, Chief

ACCOMPLISHMENTS IN SOIL AND MOISTURE CONSERVATION OPERATIONS IN GRAZING DISTRICTS, 1935 TO 1948

A REPORT BY

John Killough, Range Conservationist
Lander, Wyoming

Kenneth B. Platt, Range Conservationist
Portland, Oregon

Rowland G. Thompson, Range Conservationist
Grand Junction, Colorado

UNITED STATES
DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Washington 25, D. C.

In Reply Refer To:
GM:KBP

March 16, 1949.

MEMORANDUM

To: Regional Administrators

From: Director

Subject: Soil and Moisture Conservation Program Appraisal.

There are being transmitted to each of you copies of a summary appraisal combining the findings of separate field appraisals recently completed upon all Soil and Moisture Conservation project areas in Grazing Districts. While these are for distribution particularly to Division of Grazing personnel, they will be of broad interest and value also to other employees concerned with surface resource conservation. Other agencies in this field and users of range and forest products also may wish copies of the report. To satisfy this demand an additional supply of 1,500 copies has been prepared. Please submit requisitions promptly for the number you feel can be used to advantage in your respective regions.

This report presents a cross section of most conservation project work done in Grazing Districts since their establishment. It is the first such index we have had. As such, it deserves careful study both as information on accomplishments to date and as a guide in planning future programs.

It is my earnest desire that maximum use be made of this report. I want to suggest that all indicated personnel review it carefully and that it then be discussed in Staff Conferences at the first regular opportunity. Suitable use also should be made of this material in discussions before other interested groups, such as schools and conservation societies, as opportunity permits.

Because of their thorough familiarity with the material, the three men comprising the Committee which prepared the report will be especially qualified to present these discussions. They will be available not only within their respective regions but, upon request through this office, may be authorized to travel to Regions II, and V, which were not represented on the Committee.

The addendum memorandum accompanying the appraisal report is intended for Bureau use only. You are requested to consider thoroughly the suggestions made therein, in staff conferences or through other suitable means, and submit your comments and recommendations not later than July 10. I am sure you will agree with me that the gaps in our information and in our planning and action programs, revealed in the report, demand early action. Definite plans for such action will be announced soon.

Marion Clawson

Director.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Office of the Director
Washington 25, D. C.

March 4, 1949.

MEMORANDUM

To: Mr. G.M. Kerr, Chief, Division of Grazing.

From: Director.

Subject: Appraisal of and planning for Soil and Moisture Program.

On February 28, Messrs. Platt, Killough, and Thompson, made an excellent presentation of their appraisal of the accomplishments of the Soil and Moisture Program to date. I hope that you will convey to them my appreciation for the fine work that they have done on this study. It is evident from their presentation that the Soil and Moisture Conservation Program has many fine accomplishments of which the Bureau can well be proud. It was equally evident from their presentation that we need to do a considerably better planning job for this program than we have done in the past. I think everyone will agree that the scope of our Soil and Moisture activities is only a small fraction of that needed to do the job adequately. In one sense our activities at present are in the nature of pilot planning operations in which procedures and methods are being tested for possible expanded use at some later time. However, we have not kept the records and made the analysis which a pilot plant should produce so that we are not getting full value from our work to date.

It seems to me that at least the following steps are needed in a complete appraisal and planning job for the Soil and Moisture Conservation Program:

1. Completion of the report on the appraisal of the Soil and Moisture Conservation Program to date. I understand that these men have a rough draft report practically complete. However, there is frequently a great deal of work required to put a rough draft report into final shape suitable for publication and acceptable to all reviewers. It seems to me that the latter step should be taken before these men return to the field.

2. The forms on which the status and accomplishments of each individual S. & M. project are reported should be revised in light of experience thus far so that in the future such report forms will be both easy to fill out by field men and at the same time provide the basic data essential to a continuing analysis of the S. & M. Program. I understand that these men have been working on such a revised form. Before it is finally adopted it probably should be reviewed in the Regions and by interested Divisions in Washington. I should like to see such a report form advanced as nearly to final adoption as possible before these men return to the field.

3. The analysis of the accomplishments of the program to date clearly reveals the necessity for a rather comprehensive statement on the objectives of the S. & M. Conservation Program, on the criteria for adoption of projects and on the relationship of this program to other aspects of the Bureau's work. It is not an easy task to draft a statement of this kind on which there will be general agreement and one which will be meaningful to all concerned. However, such a statement is essential at this stage in the development of the S. & M. Program. I should like to have these three men prepare a rough draft of such a statement before they return to the field. Adoption of such a statement is likely to be delayed for a good many weeks because it should be carefully reviewed in the field and in Washington, including the Office of Land Utilization, as well as in our Bureau. However, a good first draft could be prepared at this time.

4. The analysis of the accomplishments of the program to date included no material, or very little, on costs and benefits. This is a serious omission which it is unfortunately impossible to rectify for the work done up-to-date. At the same time I think we must develop such a program for getting necessary cost and benefit data. I discussed with you the other day some possibilities along this line and I shall be glad to talk the matter over with you and the other men. If at all possible, I should like to see some rather specific proposals aimed at getting such information completed before these men leave for the field. A final program may require extended review in the field and in Washington in order to be sure of its practicability, but I think we should do everything possible at present.

5. The discussion the other day brought out rather clearly the need for establishing some standards to guide the planning of the Soil and Moisture Conservation Program. I understand that engineering standards for construction work are fairly well developed and probably adequate. I have in mind standards or guides to projects involving vegetative controls or modifications. I have in mind also certain standards of maintenance and depreciation which are essential in the management of a Soil and Moisture Program. I have in mind particularly an estimate of the maintenance cost that will be required for various types of projects. It seems to me that we should be able to make up realistic estimates of probable risks or failure of different types of projects in different areas. Experience clearly demonstrates that we cannot expect to avoid all failures and that we should count upon a certain percentage, presumably small, of failure of different types of projects. I hope that something specific along this line can be done soon, preferably while these men are still in Washington.

6. A long run Soil and Moisture Conservation Program is necessary. Such a program should be reasonably specific and should be related directly to the total conservation needs on the public lands under our jurisdiction. Formulation of a realistic long-term program is a difficult job which will take much work. While it is probably impossible to formulate such a program even in tentative form while these men are still in Washington, I would like to have them and you outline for me a procedure whereby such a realistic long-range program can be formulated during the next few months.

I shall be glad to discuss with you further any of the matters I have raised in this memorandum.

Marion Clawson

Director.

In Reply Refer To:
GM:KBP

UNITED STATES
DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Washington 25, D. C.

March 10, 1949

MEMORANDUM

To: Mr. G. M. Kerr, Chief, Division of Grazing.

From: Soil and Moisture Program Appraisal Committee.

Subject: Soil and Moisture Program Appraisal.

On January 31, 1949, the undersigned, by authority of request from the Director, reported for duty in Washington, D. C., to prepare a summary appraisal combining the findings of separate field appraisals recently completed upon all soil and moisture conservation project areas in Grazing Districts of the Bureau. We are pleased to transmit the above summary appraisal herewith.

This summary has been so prepared as to contain all the available data pertinent to its purpose, and all discussions and explanations necessary to delineate the sources, character and present disposition of the data used.

Also transmitted, as an addendum to the appraisal, is a report covering the additional information requested in the Director's memorandum of March 4. This report comprises (1) recommended revisions of the field appraisal forms currently used; (2) a recommended outline of Soil and Moisture Conservation objectives, criteria for Soil and Moisture Conservation project area approval, and relationships of Soil and Moisture Conservation programs to other Bureau activities; (3) a recommended program for securing cost and benefit data needed for program planning; (4) recommended procedure for deriving standards of project maintenance and depreciation needed for program planning; (5) recommended procedure whereby a realistic long range Soil and Moisture Conservation program may be formulated.

It is felt that the material requested in the Associate Director's memorandum of March 8, is adequately covered either in the appraisal report or in the accompanying addendum.

Respectfully,

Rowland G. Thompson, Range Conservationist
Rowland G. Thompson — Region IV

John R. Killough, Range Conservationist
John R. Killough — Region III

Kenneth B. Platt, Range Conservationist
Kenneth B. Platt — Region I

UNITED STATES
DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Washington 25, D. C.

In Reply Refer To:
GM:KBP

March 14, 1949

MEMORANDUM

To: G. M. Kerr, Chief, Division of Grazing.

From: Soil and Moisture Program Appraisal Committee.

Subject: Addendum to S&M Program Appraisal.

Reference is made to the Director's memorandum of March 4, outlining six matters to be reported on by this Committee.

The first item requested in the above memorandum was the appraisal report. This report is being tendered concurrently with this memorandum. It is thought fully to cover its allotted scope.

The second item requested was a revision of the field report forms used in the present appraisal. Revised forms have been prepared, and are attached hereto.

The third item requested was an outline of S&M objectives, criteria for project approval, and relationship of S&M programs to other Bureau activities. Committee recommendations on this matter are as follows:

I. The over-all objectives of S&M should be:

A. To institute corrective and protection programs on all Bureau lands seriously needing soil, vegetation and water conservation measures beyond those afforded through proper management, and

B. To continue such programs to a point providing for continued resource stability under proper use.

II. The criteria for project area approval should include:

A. Demonstration of sufficiently serious need to fall clearly within the objectives of the S&M program;

B. Submission of competent plans providing for,
1. Detailed and full treatment of the area;
2. Detailed and full coordination of the proposed treatment program with management plans scheduled to provide for stability and proper use of the projects applied;
3. A showing of sufficient interest and support among users to insure proper conservation attitudes, such showing to include, whenever obtainable, substantial initial contributions to program costs, plus assumption of maintenance responsibility in keeping with benefits received;

4. Definitely budgeted funds for maintenance of S&M projects, independent of user maintenance agreements but not supplanting such agreements where obtainable and effective.

C. Submission of concrete and factually substantiated cost estimates covering,
   1. All foreseeable costs involved in completion of the treatments proposed and, separately;
   2. All foreseeable costs to management beyond regular expenditures for the area, to cover special personnel, project or other needs incident to the obligations assumed under Section II-B-2, above.

III. The relationship of the S&M program to other phases of Bureau activity should provide for,

A. Proper integration of management and S&M planning activities to provide for full coordination;

B. Adequate financing and staffing of management activities to keep pace with approved S&M programs as provided above;

C. Integration with other Bureau activities such as mineral leasing, land classification, etc., wherever necessary to permit sound S&M planning and programming, and to provide proper protection of S&M work already accomplished;

D. Long term scheduling of the over-all S&M program in keeping with other Bureau plans, to provide for orderly completion of all seriously needed work over a definite, foreseeable period;

E. Early transition of S&M activities from the present special or emergency status to one covering the full Bureau program of enhancing and maintaining soil, vegetation, and water resource values on Bureau lands through means supplemental to proper management.

The fourth item requested was a program for securing project cost and benefit data needed in program planning. Committee recommendations on this matter are as follows:

Results of the recent inventory of project work completed on the Federal rangelands within Grazing Districts emphasize the need for complete and reasonably accurate records on the costs of Soil and Moisture conservation activities. The following brief outline sets forth the primary objectives of keeping and analysing such cost records.

I. Justification of proposed expenditures.

A. Cost per unit benefited.
   1. Initial expenditures
   2. Maintenance requirements

B. Total Cost of program.
   1. Original investments
   2. Overall maintenance requirements

II. Economic efficiency of operations.

A. Planning efficiency
B. Labor efficiency
C. Equipment efficiency
D. Efficiency of inspection and maintenance
E. Efficiency of materials and supplies
F. Efficiency in application of funds

III. Economic benefits of program.

A. Values returned for expenditures on individual projects
B. Values returned for expenditures on S&M areas treated
C. Values returned on total program investment

IV. Investment limitations.

A. On-the-ground land values as limiting factors
B. Downstream values as limiting factors
C. Value of natural resources as national assets
D. Wildlife values
E. Aesthetic and recreational values
F. Moral obligations to future generations

The last four objectives listed above cannot be complied with entirely from our records. Nevertheless, there is plainly an obligation to consider more than just dollars and cents values in planning and carrying out a large scale soil and moisture conservation program.

The preceding outline makes it evident that cost records are indispensable to a progressive and intelligent soil and moisture program. At the same time, it poses the following questions: (1) What specific cost information is needed? (2) How shall this information be obtained and recorded? (3) Where will the burden of this task be placed?

In keeping with the objectives outlined, the following information would be necessary:

I. Individual project costs.

A. Planning
B. Supervision
C. Labor
    1. Contract
    2. Force account
        a. On job.
        b. Travel and expenses.
D. Equipment
    1. Operations
    2. Repairs
    3. Maintenance
    4. Depreciation
E. Materials and supplies
    1. Stores
    2. Incidental

F. Maintenance
   1. Annual
   2. Total
G. Funds used
   1. S&M
   2. Contributed
   3. Other

II. Total costs of program.

A. Project area costs
B. Unit construction costs (per mile, cubic yard, acre, etc.).
C. Costs per acre affected by treatments applied
D. Total costs of individual projects based on life span

III. Supplemental information (from other sources).

A. Long term land values and returns
B. Cost of protection of downstream assets
C. Wildlife values
D. Aesthetic and recreational values

The information listed above as being necessary can, for the most part, be obtained from the present existing Form 1-519; provided it is accurately and consistently completed for each individual project. Some objections have been raised to this form and some revisions may be found desirable.

District offices seem to be inadequately staffed at the present time to keep these records in an acceptable manner. In fact, much of the fault found with past records seems to have been related to lack of sufficient clerical personnel to maintain adequate cost records and keep them up to date. However, the district office is the only logical place for these records, since all S&M project work is accomplished through these offices. Further study should be made of personnel requirements in this regard.

In summary, the reasons for keeping cost records are numerous and real. Forms exist for recording all or most of the desired information provided they are used properly and personnel can be provided to keep them adequate and current.

The Committee does not feel qualified to offer specific recommendations on details of such a study. It is recommended, therefore, that the matter be referred to the field for more detailed suggestions.

The fifth request covered several closely related items bearing on project standards, risks, and maintenance considerations.

It is felt that present standards outlined in the engineering handbook of the former Grazing Service are adequate for all structural projects. As pointed out in the appraisal report, the data at hand on reseeding results do not warrant derivation of any guides or standards beyond those which already are common knowledge in the field, nor do they provide a sound

basis for deriving estimates of probably success or failure.

The data secured for the present report did not provide for measuring risk or failure of projects generally. Rather, this element was largely eliminated from the data by confining project inspections in most Regions to active projects. Projects recorded as abandoned were omitted from the inspection. It is felt that this omission was well advised, as a great many of the early project failures and abandonments resulted from causes which now are routinely avoided. Accordingly, it is recommended that any current study of risk or failure which may be contemplated should be so applied as to cover only those projects representative of current conditions. Such a study properly should be made at District level, and should cover all projects rather than only those in S&M areas, in order to secure reliable data. Since the revised project appraisal form provides for all data needed in such a study, its use would avoid the need of a special form.

As with risk and failure, so with maintenance and depreciation, the data secured for the present report is not adequate. The Committee has devised a suggested outline of data necessary for a study of maintenance and depreciation rates, which outline is attached as a suggested form. Again it is recommended that the study, if made, be at District level, and that it be district-wide rather than confined to S&M areas. If maintenance standards are established from such a study, or otherwise, a logical first step in their application would be initiation of a system of continuing inspections adequate to provide current information on maintenance needs. District personnel then would use this information in planning priorities, routes, equipment needs, etc., in maintenance programs.

The sixth item requested in the Director's memorandum was a procedure whereby a realistic long range S&M program may be formulated. The following outline contains the recommendations of the Committee on this matter:

I. New maps of erosion condition, on not smaller than 1/2-inch per mile scale, should be prepared in the field to show the following mutually exclusive erosion classes:

   A. Location and acreage of all areas of severe to critical accelerated erosion;
   B. Location and acreage of all areas of moderate accelerated erosion;
   C. Location and acreage of all areas of slight or harmless erosion;
   D. Location and acreage of all areas of harmful geologic erosion of a character or degree not amenable, under present knowledge and experience, to usual S&M treatments.

II. Field offices should reexamine all existing S&M areas regarding their relationship to the above categories of erosion. Existing areas lying wholly or partially outside severe to critical erosion areas, or containing only minor proportions of such areas, should be reduced in priority of work programs in favor of more needful areas. Where such reduced priority will result in indefinite postponement of work on an existing area, recommendations should be submitted proposing (1) a terminating program required to complete remaining urgent work or to protect or complement previous project

investments, or (2) suspension or (3) closing of the area. Similar action should be taken with respect to non-critical and non-severe portions of existing areas which are to be continued in high priority, where such portions do not form a necessary part of the management plan affecting proposed remedial measures.

III. As rapidly as possible, new area proposals should be submitted from the field to cover all severe to critical erosion areas not already included in existing S&M project areas.

IV. As nearly as possible, each existing and proposed S&M project area should be planned in full detail as to actual numbers, types, locations and scope of individual projects, together with all proposed management readjustments. Cost estimates should be prepared for each individual project on Form GrS 33, showing materials, supplies, equipment, labor, engineering, supervision, etc. (no project number to be assigned until projects are currently programmed).

V. Program completion should be planned to fit with scheduled, attainable, management adjustments essential to most effective results, and the budget for the project area shaped to that schedule.

VI. The revised erosion condition maps prepared under Item I should be subjected to a field review by a committee composed of (a) a representative of the Director's Office qualified by wide familiarity with all Regions to judge the relative conservation needs involved, and (b) suitable field representatives, preferably a range conservationist from each Region. The committee would be charged with final determination of inter-regional uniformity of erosion classification and with rating all existing, proposed, and potential project areas into two categories of conservation treatment need, namely, (1) urgent, and (2) desirable. This rating would exclude all areas amenable to full correction through management alone, and would exclude all considerations of programming.

VII. Acting upon the Committee findings, the Director's Office should reconsider its inter-regional allocation of S&M funds for possible readjustments in line with relative needs.

VIII. Copies of the new adjusted classification maps, acreage figures and data on conservation need categories should be referred by the Director's Office to the Office of Land Utilization for review, and substantial agreement on future S&M programs should be worked out on the basis of this new information.

IX. Suitable instructions to field offices should follow.

Definitions - For the purpose of the classification here proposed, the various erosion classes shall be defined as follows:

A. Severe to critical accelerated erosion shall be defined as erosion beyond the geologic normal which is actively depleting soil resources to a degree requiring correctional treatments beyond those afforded

through proper management adjustments in order to avoid continuing losses, and which is amenable to full control or marked benefit by application of usual S&M treatments accompanying proper management. It is to be distinguished from geologic erosion not amenable to such treatments, irrespective of the seriousness of such geologic erosion either locally or as affecting downstream values.

B. Moderate accelerated erosion shall be defined as erosion beyond the geologic normal to a degree making corrective measures advisable, but entirely correctable by proper management adjustments, without recourse to usual S&M treatments.

C. Slight or harmless erosion shall be defined as (1) accelerated erosion so slight as not to be readily distinguishable from normal geologic erosion, or (2) normal harmless geologic erosion, or (3) a combination of the two.

D. Harmful geologic erosion shall be defined as geologic erosion of a degree either permanently depleting local soil values or causing downstream damage, or both.

In the opinion of the committee, the above proposal to reclassify erosion conditions should receive first consideration. Not only is the information sought here vital in its own sector--it is equally vital to the soundness of program readjustments suggested under item three and to the continuing validity of cost and benefit information which may be secured under item four.

Two additional factors, not explored in either the report or the Director's request for special treatment of various matters, appear worthy of consideration here.

First, the good results secured from cooperative maintenance agreements where applied, naturally argue their further application. The present heavy incidence of such agreements in Regions III, IV, and V, and their relative scarcity in Regions I and II suggests need for study of the causes of this difference. Field experience has been that where the range user can see a clear benefit to himself from a given project he is usually willing to cooperate on its cost and upkeep, but that where such benefit is uncertain or distant he is reluctant to invest his time and money. This has resulted in most cooperative agreements occurring on individual allotments or on group allotments which are under rather close control. Projects on common use ranges, by contrast, are much less frequently covered by cooperative agreements. This situation presents an avenue for possible further gains through more detailed adjudication of present common use ranges. At the same time it suggests that projects tied more definitely to the welfare of particular individuals may, in the end, prove more beneficial to all than do projects built for the general benefit.

Second, the committee feels that thought should be given the hiatus existing between the program of soil and moisture conservation and that of management and protection, as they apply in the over-all field of range

management. As these programs are now drawn, S&M funds can be applied only to approved S&M project areas, which in turn are confined to areas of severe to critical erosion. The MPD program, on the other hand, has not even sufficient funds adequately to maintain existing projects, so cannot do extensive new work. This means that the vast job of range rehabilitation, affecting those lands which are seriously depleted in forage yield but which do not present serious erosion problems, and which cannot be restored by proper management alone, cannot be reached by either program.

Finally, the committee feels that special thought should be given the position of the management organization, both historically and as affected by the proposals offered in this memorandum. The fact that many project failures have resulted from inadequate planning, or from improper use traceable to lack of management follow-up, has been brought out in the project appraisal. It would be grossly unfair, however, to conclude that these poor results stem chiefly from incompetence of the personnel concerned. Rather, the facts are that personnel numbers never have been adequate to the task at hand; that funds never have been adequate to accomplish even the most obvious needs; that deficiencies in enforcement regulations often have precluded adequate control of range use; and that plans, no matter how well conceived and prepared, often simply could not be put into effect.

Accordingly, the perfection of new plans and approaches to the same old problems will not in themselves solve these problems. If management plans and S&M plans are to be meaningfully coordinated, the management organization at district level must be strengthened or supplemented in keeping with the added obligations inherent in such coordination.

Respectfully,

Rowland G. Thompson, Range Conservationist
Region IV

John R. Killough, Range Conservationist
Region III

Kenneth B. Platt, Range Conservationist
Region I

enclosures

Suggested Form for Deriving Maintenance and Depreciation Rates

Kind of Project	Project Name	Units: Kind	Units: No.	Project No.	Year Completed	Present Condition: Good	Present Condition: Fair	Present Condition: Poor	Original Cost	Cost of Present Estimated Maintenance Needs	Previous Maintenance Costs	Total[1] Maintenance	Annual Maintenance Cost	Annual[2] Maintenance Rate
									$	$	$	$	$	(%)

(1) Previous plus present needs.

(2) Total maintenance plus original cost divided by years of service.

(3) $\frac{100}{\text{Life Expectancy}}$

Annual Maintenance Rate (%)	Estimated Life Expectancy		Estimated Depreciation Rate (3)	
	With Maintenance (Yrs.)	Without Maintenance (Yrs.)	With Maintenance	Without Maintenance

Revised
3/10/49

DEPARTMENT OF THE INTERIOR
Bureau of Land Management

RESEEDING OPERATIONS REPORT

Region No. . . . . .
Grazing Dist. No. . . .
County . . . . . .
S&M Area No. . . . . .
Project No. . . . . .

Project Name . . . . . .

1. Location by legal subdivisions:

2. Site description:
   Soil type and texture:

   Average annual precipitation inches: Seasonal distribution:

   Topography and slope:

   Vegetation (List dominant species), condition, thrift:

   Density : %shrubs: % herbaceous plants.

   Grazing capacity acres per AUM.

3. Describe erosion conditions:

4. Describe history of grazing use as related to current range and erosion conditions:

5. Describe current management, degree of utilization:

6. Date reseeding started, : Completed, .

7. Acres reseeded, . Rate of seeding, lbs. per acre,

8. Seed used: Specie , % of mixture; Specie
   % of mixture; Specie , % of mixture.

9. Costs: Seed $ S&M . . . . Private . . ., Labor $ . . . . ., Equipment $ . . . . ., Other $ . . .
   Other . . . . . .

   Total cost $, Cost per acre $, Total Cost S&M . . . . . .
   Private . . . . . .
   Other . . . . . .

10. Describe soil moisture conditions at time of seeding, and subsequent precipitation:

11. Seeding method used (Concise Narrative):

12. Brush removal (Describe method and percentage of kill):

13. Is reseeded area adequately marked?

14. Describe provision made for protection:

15. Maintenance Agreement: Yes . . . ., No . . . .

16. Remarks (Record any pertinent or unusual facts not covered above):

17. Support report with photographs.

Date of examination . . . . . Made by . . . . . .
(Name)

. . . . . .
(Title)

Prepare in triplicate: 1 copy to: District Office, Regional Office, Director

(Use additional sheets if necessary)

Revised
3/10/49

DEPARTMENT OF THE INTERIOR
Bureau of Land Management

APPRAISAL OF RESEEDING OPERATIONS

Region No. . . . . .
Graz. Dist. No. . . .
County . . . . . .
S&M Area No. . . . . .
Project No. . . . . .
Completion Date . . .

Project Name . . . . . No. Units . . .
Refer to Reseeding Operations report dated . . . . . .

1. Location of reseeding area:

2. Vegetation (List dominant species);
Density: ; % shrubs; % herbaceous plants; % seeded species

Grazing capacity to acres per AUM (Before reseeding . . . . . .
(After reseeding . . . . . .
(Estimated potential . . . . . .

3. Results of reseeding operations: Success . . . ., Moderate success . . . . . ,
Failure . . . . ., Poor . . . . . .
a. Give reasons for result indicated:

b. Recommended treatment: Develop further . . . ., Rework . . . .,
Maintenance . . . ., Abandon . . . ., Other (specify) . . . .

4. Describe vegetative conditions and influence of reseeding operations:

5. Describe erosion conditions and influence of reseeding operations:

6. Describe current utilization and management and influence of reseeding operation:

7. Remarks: (Include all changes, recommendations and reasons therefor):

Support report with photographs.

Date of inspection . . . . . Made by . . . . . .

Title . . . . . .

Is report acceptable to Administration? Yes . . . . No. . . .
If not, reason . . . . . .

(Signed) _____

Prepare in triplicate: 1 copy to: District Office, Region, Office of Director.

(Use other side if necessary)

Revised
3/10/49

DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Project Inspection Report

Region No. . . . . .
Grazing Dist. No. . .
County . . . . . .
S&M Area No. . . . . .
Project No. . . . . .
Completion Date . . .

Project Name . . . . . No. of units . . . . .

Type improvement (Describe) . . . . . .

1. Location by legal subdivision . . . . . .

2. Condition of Project: Good . . . ., Fair . . . ., Poor . . . ., Failure . . .

   a. Reasons for condition: Inadequate Planning . . ., Inadequate Construction or Method . . ., Normal Deterioration . .,Improper Use . . .,Other, Specify .

   b. Recommended future treatment: Normal maintenance . . .,Reconstruction . . ., Develop Further . . ., Salvage, or other use . . .,Abandon . . .,Repeat . . .

   c. Describe needed repairs, give estimates and total cost: Labor . . ., Materials . . ., Equipment . . ., Total Cost . . . . . .

3. Erosion conditions on area influenced by project.

		Sheet	Gully	Wind
Degree	(Critical			
	(Severe			
	(Moderate to 0			
Direction	(Improving			
	(Stable			
	(Decline			

4. Overall effect of project on range values:

	Erosion Control	Vegetation	Management
Helpful			
Neutral			
Adverse			

5. Recommended remedial management practices (Give in Detail):

6. Other remarks:

7. Maintenance Agreement: Yes . . . ., No . . . ., Effective . . ., Non-effective..

Support report with photographs.

Date of Inspection . . . . . Made by . . . . . .
Title . . . . . .

Is report acceptable to Administration? Yes . . . . . ., No . . . . . .
If not, reason . . . . . .

(Signed) _____
Range Manager

Prepare in triplicate: 1 copy to: District Office, Region, Office of Director.

F O R E W O R D

The program of rehabilitating the public domain lands through the institution of revegetation, and flood and erosion control treatment and practices is a phase of the National program of soil conservation envisaged and provided for in the Act of 1935. Between this date and 1940, the work was conducted by the Soil Conservation Service of the Department of Agriculture. Thereafter, the part of the National program on the public land in grazing districts has been managed by the former Grazing Service and its successor, the Bureau of Land Management.

In 1948, the Bureau of Land Management undertook the examination of the projects processed in grazing districts through the years to ascertain the effectiveness of the various structures and treatments in the conservation of the soil, vegetation, and water resources. The report which follows, constitutes a summary of project accomplishments and an evaluation of these accomplishments based on the analysis of the reports on individual project examinations. It presents a cross section of most conservation work done in grazing districts since their establishment. It is the first such index of the adequacy and values of various kinds of treatment. The analyses were thorough and critical, and the conclusions therefrom are frankly and honestly portrayed.

Marion Clawson

GENERAL INDEX

INDEX TO CHARTS AND TABLES

APPENDIX

SUMMARY DISCUSSION

The present report includes an estimated coverage of at least 85 per cent of all existing projects in the S&M project areas, on such points as numbers of projects and numbers of units (acres, miles, etc.) completed. Above 90 per cent of all projects directly significant to conservation are considered to be within this coverage. Individual field reports on 2,374 projects, representing roughly 66 per cent of the estimated total existing projects and 70 per cent of all projects directly significant to conservation, are included in the analyses. It is felt that this 70 per cent coverage is sufficiently representative and broad to give reliable data on all points analysed across the whole body of the material, such as project condition, effect, failures, etc.

Of 25 kinds of projects analysed, 19 occurred in either sufficient numbers or sufficient scope to give what is felt to be reliable evidence. Of the remaining 6, five have not been found sufficiently applicable to project area problems to become important in current conservation programs, and the other (check plots) has no direct conservation significance. The various project groupings by classes, individual kinds, conditions, effects, etc., upon which the present narrative is based are presented in six pairs of Region and State tables in the Appendix. All tabulations there shown were derived from detailed individual project tally sheets which are not suitable for inclusion in the report, but which should be sent to the field for use in possible inter-area comparisons within Regions.

As noted in the introduction, a great majority of the individual project reports here analysed comprise on-the-ground appraisals by conservationists and others competent to secure the desired information. It is recognized that the report forms themselves permitted some latitude in caliber of reporting, and considerable range was noted in this respect. On the whole, however, the individual reports either conveyed the desired information explicitly or were so supplemented by the accompanying project area narrative reports as to convey it implicitly.

These reports provided adequate data for mass analysis on seven major points significant to the S&M program: (1) physical condition; (2) causes of physical depreciation or failure; (3) effect upon soil, vegetation and management values; (4) reasons for failure to aid these values; (5) needed remedial action; (6) effectiveness of maintenance agreements; (7) results from various methods of reseeding. Besides these over-all analyses, many useful comparisons between various kinds and groups of conservation treatments were revealed. Similarly, many inter-regional comparisons are brought out, some of which indicate special applicability of certain treatments to certain areas, while some may suggest possible readjustments of program.

Among the more outstanding cases of apparent special applicability were the concentration of 91% of brush and weed control treatment in Region II; confinement of all tree planting to two projects in Region III and one in Region V; occurrence of 40% of all fences in Region V; occurrence of 95% of all contouring and 64% of all water spreading in Region III; and the strong reliance upon wells in Regions II and V as compared with a large preponderance of surface water developments in the other three regions. Equally significant was the fact that such projects as reseeding, reservoir construction, spring development, fences and access roads appeared in large quantity in all regions.

Several limiting factors need to be kept in mind in drawing conclusions from the study, particularly in making inter-regional comparisons and in evaluating the projects occurring in relatively small numbers in any one region. First, the report is more complete for some States than for others and for some regions than for others (see footnotes to Table II, Appendix). Not all kinds of projects were reported on in all instances, those thought to have little direct influence upon conservation values frequently being omitted. Figures on numbers of projects therefore are not conclusive. Totals for individual kinds of projects especially might be subject to material change if complete coverage were secured.

Second, differences in competence or interest of the many persons making the individual project reports and project area reports are reflected in differences in detail of data recorded and, in some cases, in the reliance to be placed in the individual data. Such differences showed up most noticeably in the rating of soil and vegetation conditions by project foremen and others not thoroughly trained in these matters. Although such cases are a small minority and become relatively unimportant in the totals, they make fine delineations and comparisons of results inadvisable.

Third, differences in outlook upon the conservation program are inherent in the wide differences in soil, vegetation, and moisture conditions which influence or even dictate methods of attack and limits of usefulness of various treatments from place to place. For example, reports from Region II generally showed no benefit to soil and vegetation values from water developments, fences, and other projects intended to aid these values through improved distribution and management of grazing, whereas reports from Region I generally showed the opposite. The difference here reflected is felt to be as much a difference in regional outlook as in actual accomplishment. Whereas the natural sparseness of vegetation and small number of projects per unit of area combine to make indirect benefits to soil and forage difficult to demonstrate in Region II, the opposite situation in Region I makes such benefits readily apparent in many instances and soundly presumptive in many more. Accordingly, it is felt that the above negative reports from Region II may not reflect so much a lack of benefit from the treatments concerned as a lack of sufficient scope or intensity of treatment to make the benefit readily evident.

Fourth, several unresolved variables have influenced the results secured from time to time and from place to place. Reseeding results are especially vulnerable to such variables in the highly complex pattern of temperature, moisture, wind, soils, seed efficiency, seeding method, seed bed preparation, carefulness of operations, etc. Cases are found where an outstandingly successful drilled seeding was followed in the next year by a total failure on an adjoining area, where the same equipment was used, planting seed from the same stock, at the same season, on a seed bed apparently as favorable and under comparable moisture conditions. Such cases cannot be explained in our present knowledge. Until they can be explained they cannot be evaluated as factors in the method concerned. Until they can be evaluated the method itself can be appraised only in a general way.

Another variable not measured in the various comparisons was that of relative age of projects. This factor influences the degrees of depreciation or failure tabulated for the various kinds of projects. Spring developments, for example, were among the early major activities of CCC camps in some areas and are now beginning to show relatively large numbers of failures. Fences built in the early years of project activity likewise have reached an age of heavy depreciation. By contrast many of the newer conservation activities have not been in use in quantity long enough to determine probable depreciation rates.

Still another variable arises from the shortage of construction materials prevailing during the war period. Many projects were incompletely done or done to low standards because of this, with the result that a disproportionate number of them now are reported in poor condition.

Both the foregoing factors influence the analysis of effectiveness of maintenance agreements. Since most of the earlier projects were not covered by maintenance agreements, the majority of age-connected project failures tends to fall in this uncovered group. No segregation on an age basis could be made in the analysis, as age of individual projects was not indicated. The effect of war shortages may be essentially equal in both groups, but this can only be surmised. Consideration of current condition of projects not covered by maintenance agreements also should take into account the fact that lack of maintenance by the Bureau often reflects lack of adequate maintenance funds more than neglect or poor planning.

Inter-regional comparisons of project numbers should take into account the differences in construction requirements from place to place. Retention dams in Regions I and II, for example, usually need not provide either for cloudburst shock or for heavy siltation, whereas in Regions III, IV, and V one or both usually must be provided for. Consequently, dams built in the first two regions ordinarily are smaller and less costly than in the other three regions. Again, impoundments in Utah,

Nevada, Idaho, and Oregon must be kept small in most cases in order not to infringe upon irrigation water adjudications, whereas in Arizona, New Mexico, Montana, and Wyoming, large structures are encouraged for silt and flood control. Some parts of Colorado are affected by one of these situations, others by the opposite.

Comparative usefulness of the 26 kinds of projects listed can be assessed only in broad terms. In general, most kinds of projects show about equal benefits to conservation aims. Greatest total benefit therefore is generally attached to the projects occurring in greatest numbers.

Obviously, an appraisal resulting in such uniform values does not measure all value factors known to exist. Among these factors, three in particular are noted: (1) area of benefit, (2) degree of benefit, and (3) total benefit from each particular project. To illustrate, let us assume a reseeding project, a detention dam and a fence in the same general area. Each is rated beneficial to all three resource values--soil, vegetation, and management--for reasons easily pictured and frequently true. On this basis all would be rated equal in the present study. Yet the reseeding might be 100% effective in producing maximum forage and affording maximum soil protection on a few score acres, while the reservoir might have smaller beneficial effects over several hundred acres, and the fence might have still smaller beneficial effects over several thousand acres. Any one of the three might give far greater total benefit than either or both the others.

It is readily seen that merely to tabulate projects on the basis of whether they are beneficial or otherwise, as was done in this report, is essentially a qualitative measure of benefit, not evaluating any of the above quantitative factors. On the other hand, the elusive character of the quantitative measures desired soon is appreciated when one considers the difficulty of accurately assessing the relative values mentioned in the preceding paragraph.

In the absence of direct quantitative measurement, recourse is had to the fact that the numerical preponderance of qualitatively beneficial results found is in itself a broad quantitative indicator, although only an indicator. Until some ready means of direct quantitative evaluation of the above three factors is devised, it appears we must operate on the basis that any gain justifies the means, trusting to on-the-ground judgment to avoid obvious abuses.

Relying on such judgment at this point it may be categorically stated that the reservoirs constructed have contributed more to the conservation of soil, vegetation, and water resources on grazing district ranges than have any other conservation treatment. This is true not only because there have been more reservoirs constructed than other projects, but because of their high frequency of success, low maintenance requirements, multiple benefits and over-all efficiency.

Following reservoirs come other water developments contributing to improved livestock distribution and range use. Fences properly planned and used as tools of improved management have been similarly valuable. Reseeding, though highly beneficial where successfully applied, so far has affected only a relatively small area. The same may be said of the remaining vegetative and water control projects generally.

Comparisons of conservation effectiveness between the three major project groups--vegetative control and protection, water control, and range use facilitating--should take account of the fact that the assignment of various projects within these groups is somewhat arbitrary. Fences, for example, are one of the most important aids to management and might as logically be placed in the range use facilitating group as in the vegetative control and protection group; or they might logically be divided between these groups. Springs and wells do not present problems in water control from a direct erosion control viewpoint so much as problems in livestock distribution and management. They, too, might logically be classed as range use facilities.

It is plain from the accompanying analyses that the conservation program in S&M areas to date has been a worthy one. A large majority of projects have definitely improved soil, vegetation and moisture conditions, both individually and in total. Additionally, these projects have contributed widely to improvements in range management and use whose beneficial effects will carry on long after the more immediate and direct benefits have ceased. The evidence appears ample to justify continuation of the program as a whole, as long as similar benefits continue.

Notwithstanding these generally favorable aspects, it is equally plain that important facts are lacking in the analyses which should be available for consideration in planning future programs. Outstanding among these needs are (1) accurate delineation of erosion problem areas, including subdivision into suitable categories of treatment need; (2) reliable cost-to-benefit data on all major kinds of conservation projects; (3) general investment limits justifiable upon the subject lands; (4) reliable depreciation and maintenance rate data on all major kinds of conservation projects; (5) definite goals of conservation intensity by which to delimit programs.

Only when this additional information is at hand will it be possible fully to appraise the work already done. Only then will it be possible to base further work on sound economic justification. And only then will it be possible to outline future programs on the elements of character, direction, scope and objective which should characterize all sound planning.

I. INTRODUCTION

The special program known as Soil and Moisture Conservation, as applied to grazing district lands, is an outgrowth of the National Soil Conservation Act of 1935. Early projects under this act were initiated in various grazing districts by the Soil Conservation Service. In 1940 these projects, together with authority for all further such projects on grazing district lands, were transferred to the Department of the Interior. All subsequent grazing district work under this authority has been carried out by the Bureau of Land Management and its predecessor, the former Grazing Service. The program carries the Departmental title of Soil and Moisture Conservation Operations, commonly abbreviated to S&M work.

As set forth in the parent Act, the purpose of the Soil and Moisture Conservation program is to "control and prevent soil erosion and thereby to preserve natural resources, control floods, prevent impairment of reservoirs," etc. Applied to the 134,898,370 acres of Federal Range lands contributing important runoff to major irrigation and power development projects, the program has been carried to the grass roots for greatest effect. Emphasis has been placed upon vegetative restoration as the first line of defense against accelerated erosion. Direct water control through construction of many types of dams, contours, terraces, water spreaders, etc., has received similar emphasis. Complementary and facilitating projects such as fences, access roads, stock trails, etc., have effectively augmented these primary conservation measures. At the same time such facilitating projects have furthered the management adjustments necessary to effectuation of the conservation aim.

The purpose of this report is to review and evaluate the work done to date under the above program. Not only the total effect of the program, but valuable comparisons of various kinds of conservation projects, are set forth. Various limitations and adaptations of particular kinds of projects to particular areas are revealed. Corollary conservation values of many kinds of projects usually considered as chiefly of administrative usefulness appear in the massed data. The report proposes to set forth as clearly as possible these various values, for consideration in future planning of conservation activities of the Bureau.

With the need for such a summary in mind, field employees were supplied in the summer of 1948 with report forms suitable for individual project inspections. On-the-ground appraisals were made in a great majority of cases. Where current direct inspection was not possible, information was secured from range users familiar with the projects, from range improvement foremen, project maintenance crews, district range managers, and others having recent knowledge ofparticular projects. These individual project appraisals for a given S&M project area were reviewed by the responsible conservationist and range manager, who then collaborated in a narrative summary report on the project area as a whole.

The following report is based on the findings of the foregoing field appraisals. Samples of the individual project and project area report forms used are included in the Appendix. Copies of all completed reports are on file in the Grazing District of origin, the Region of origin, and the S&M Branch of the Division of Grazing, Office of the Director.

II. SCOPE OF THE REPORT

A. REPORT COVERS FOURTEEN YEARS, 1935-1948

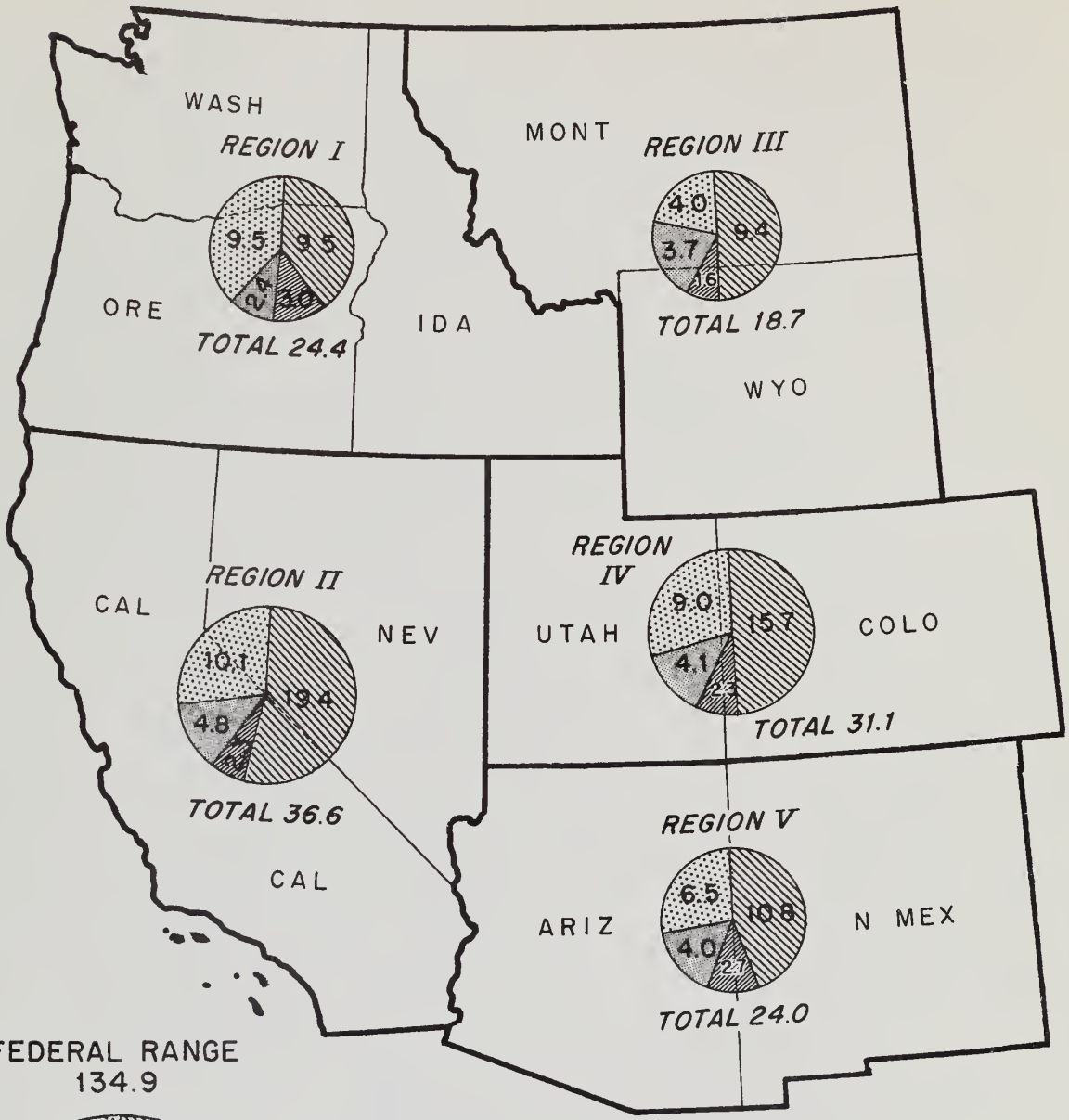
The material analysed in this report embraces all conservation project work done under the S&M program. On some project areas such work dates back to the early years of the National Soil Conservation Act, mentioned above. Other areas have been set up for project work successively over the intervening years, so that periods of S&M activity vary from one year or less up to the maximum.

In addition to S&M projects, the report covers similar work done with other funds. Projects completed under other programs antedate S&M work in most project areas, since relatively few areas were established under the S&M program before 1940. Many Civilian Conservation Corps camp programs date back to 1935 and 1936. Other projects were completed under the Drought Relief Act of 1934. Smaller numbers of projects built with private funds under provisions of Section 4 of the Taylor Grazing Act also antedate S&M work in some instances. Project reports from which the present analysis is derived generally covered all conservation-related projects completed to the end of calendar year 1948 under all programs. Overall, the report may be regarded as covering the period 1935-48, inclusive.

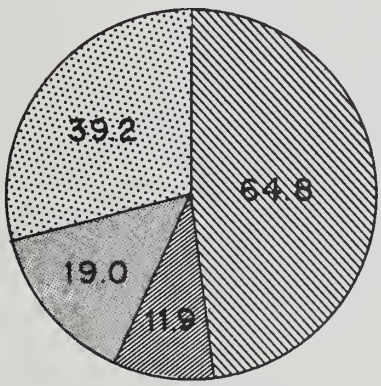
B. ONLY GRAZING DISTRICT PROJECT AREAS REVIEWED

Only project areas lying within grazing districts are covered here. These were distributed over ten States in five Bureau of Land Management Regions as follows: Region I--Idaho, 13 areas; Oregon, 8 areas; Region II--California, 4 areas; Nevada, 12 areas; Region III--Montana, 6 areas; Wyoming, 13 areas; Region IV--Colorado, 23 areas; Utah, 17 areas; Region V--Arizona, 5 areas; New Mexico, 11 areas. Acreages involved are Federal Range only. These are shown by Regions and by States in Appendix Tables I and I-A. Various relationships of these acreages to grazing district acreages and acreages under severe to critical erosion are presented diagrammatically on the following outline map (Page 8) of the Grazing District States.

SEVERE TO CRITICAL EROSION ON THE FEDERAL RANGE



FEDERAL RANGE
134.9



LEGEND

AREA UNDER SEVERE TO CRITICAL EROSION

- OUTSIDE OF S. AND M. AREAS
- WITHIN S. AND M. AREAS

AREA NOT UNDER SEVERE TO CRITICAL EROSION

- WITHIN S. AND M. AREAS
- OUTSIDE OF S. AND M. AREAS

NOTE: FIGURES ARE IN MILLIONS OF ACRES

Study of the map and tables reveals a wide discrepancy in estimates of area under severe to critical erosion in grazing districts. Existing S&M areas are thought to cover a majority of the total acreage needing the special erosion control treatment falling under S&M programs. Nevertheless, these areas include an aggregate of only roughly 16 per cent, or one-sixth, the area in urgent erosion control need status as shown by figures now in use in the Department covering lands under severe to critical erosion. Although erosion conditions are known to have abated under improved climatic and range management conditions prevailing since earlier surveys, it is felt that differences in viewpoint on the seriousness of existing erosion probably account for most of the difference. A need for further study of erosion conditions in grazing districts to resolve this discrepancy more explicitly is suggested by the figures here presented.

C. DEPARTMENTAL PROJECT CLASSIFICATION FOLLOWED

Following in general a project grouping applied in the Department of the Interior to the soil and moisture conservation work of all its agencies, the projects covered in this report were treated in three major classes, namely, (1) vegetative control and protection, (2) water control and (3) range use facilitating. This grouping is shown in full in the outline below. Totals of 673 projects, 1,972 projects, and 393 projects fall in the three respective groups. Further detail on numbers of projects covered and their distribution within groups is presented in Charts 1 and 2, and in Appendix Tables II and II-A.

Kinds of Projects

Group Classification

1. Vegetative Control and Protection Group.

    1. Brush and Weed Control
    2. Pest Control
    3. Seeding and Planting
    4. Tree Planting
    5. Fire Protection
    6. Fencing
    7. Check Plots

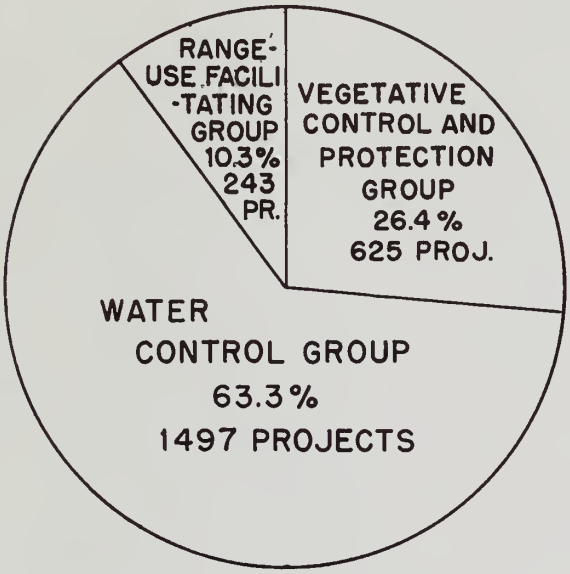
2. Water Control Group.

    1. Canals and Ditches
    2. Contouring
    3. Diking
    4. Water Spreading
    5. Checks
    6. Dams, detention
    7. Dams, diversion
    8. Dams, retention

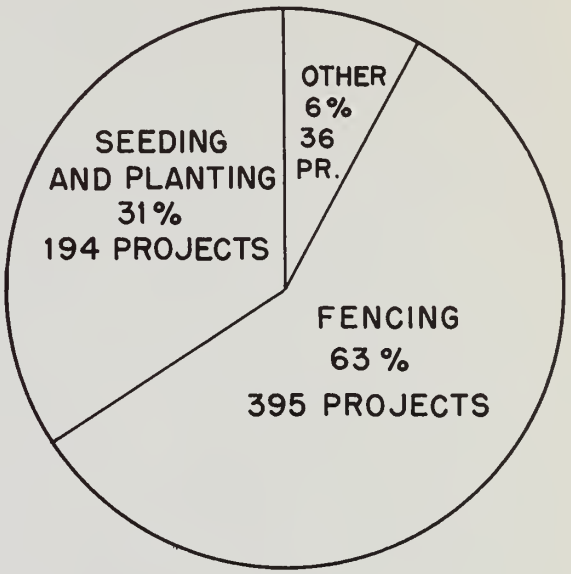
= CHART 1 =

NUMBER OF PROJECTS EVALUATED, BY CLASS OF PROJECTS

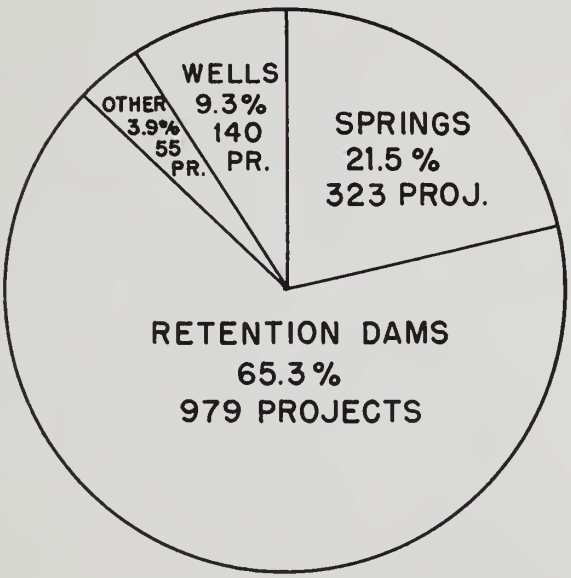
ALL PROJECTS
2365 TOTAL



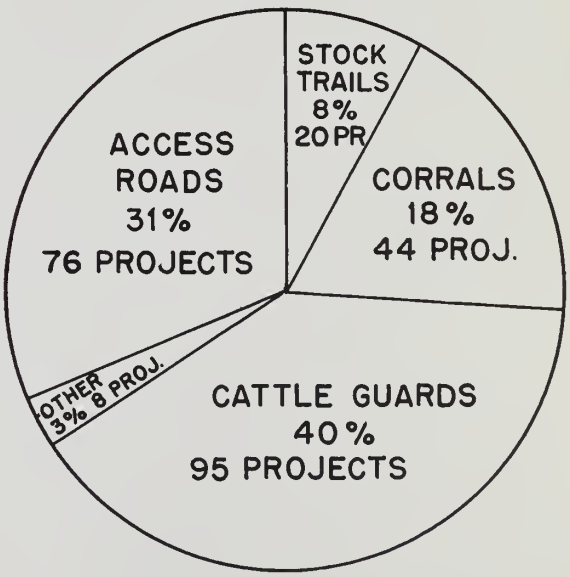
VEGETATIVE CONTROL AND PROTECTION
625 PROJECTS



WATER CONTROL PROJECTS
1497 PROJECTS

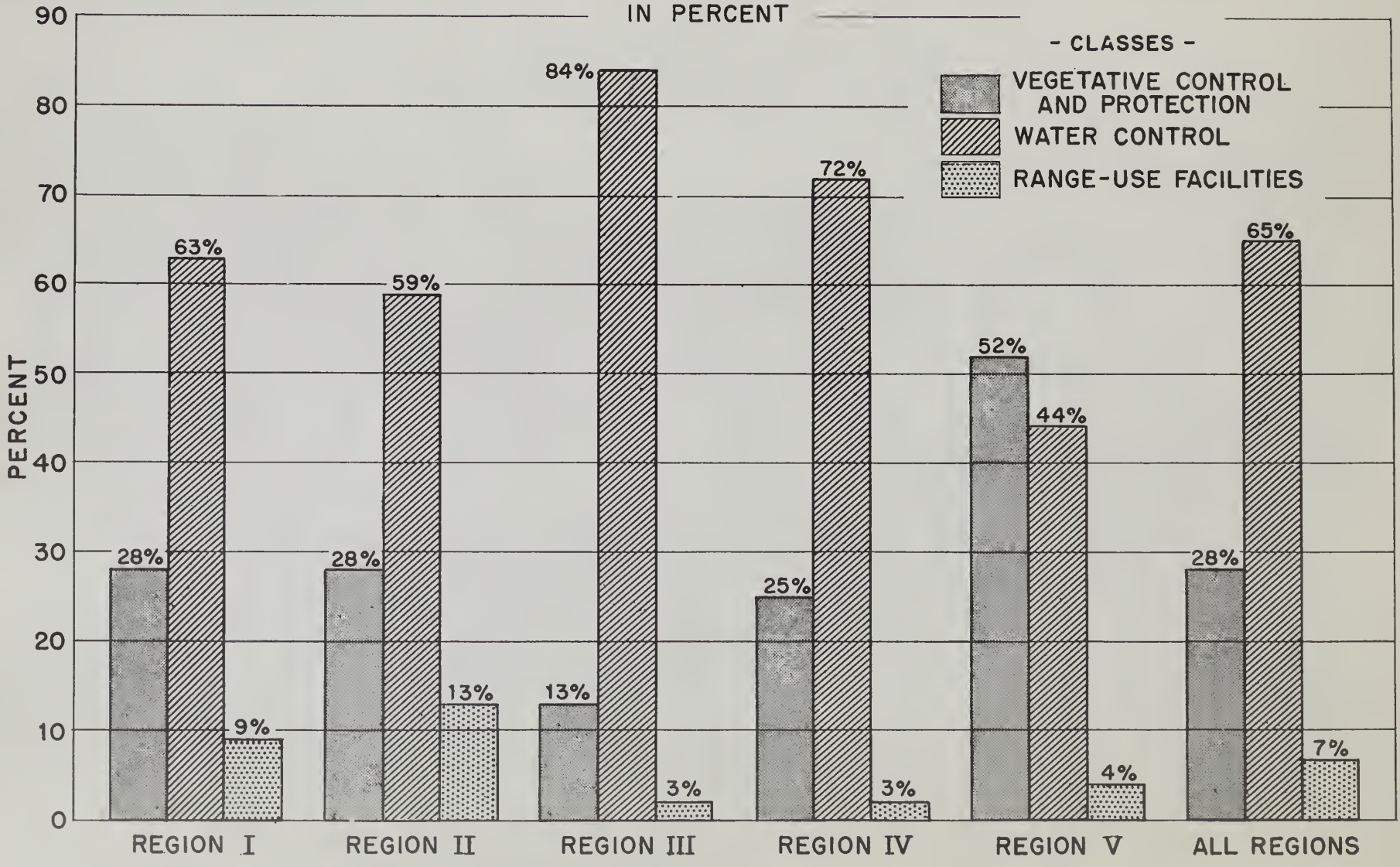


RANGE-USE FACILITATING PROJECTS
243 PROJECTS



= CHART 2 =

CLASSES OF PROJECTS CONSTRUCTED IN THE FIVE GRAZING REGIONS



2. Water Control Group (Continued)

9. Streambank Protection
10. Springs
11. Wells
12. Pipelines
13. Storage Tanks

3. Range Use Facilitating Group.

1. Bridges
2. Corrals
3. Cattleguards
4. Pack or Stock Trails
5. Access Roads (Truck Trails).

III. ANALYSIS OF PROJECT ACCOMPLISHMENTS

A. PROJECTS ANALYSED ON SEVEN POINTS

Twenty-five different kinds of projects were reported upon from the field in sufficient numbers or scope to give significant data. Seven points important as measures of past accomplishment or as guides to future planning were tabulated from these field reports, as follows:

1. Physical condition
2. Effectiveness in aiding range resource values
3. Relative effectiveness of vegetative control and protection projects as a group, water control projects as a group, and range use facilitating projects as a group.
4. Relative effectiveness of various selected kinds of projects (springs, fences, etc.)
5. Reasons for inferior condition or results of projects
6. Incidence of adverse effects of projects
7. Recommended future treatment of projects

Most Projects Found Physically Sound

Field reports rated each project as in good, fair, or poor physical condition. Of the total projects inspected (Chart 3), 74% were reported in good condition, 14% in fair condition, and 12% in poor condition. The bulk of poor and fair condition projects fall among the early accomplishments of the Civilian Conservation Corps, early private developments, and other early projects. This is true especially of those projects now nearing the end of their life span, such as spring installations using wooden troughs.

= CHART 3 =

PHYSICAL CONDITION IN 1948 OF EVALUATED PROJECTS BY CLASS OF PROJECT

ALL PROJECTS

VEGETATIVE CONTROL AND PROTECTION

WATER CONTROL PROJECTS

RANGE-USE FACILITATING PROJECTS

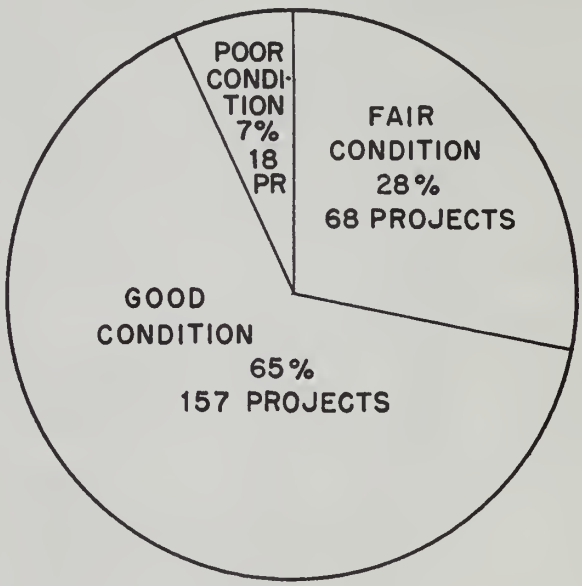


Chart 3 also compares conditions among the three major project groups. Here we find the water control group leading, with 78% of all individual projects in good condition. The vegetative control (69%) and range use facilitating (65%) groups are virtually equal in good condition projects, but range use facilities show an advantage in having the least percentage in poor condition of any group.

A third condition study is summarized in Chart 4, which compares selected kinds of projects.

Majority of Projects Beneficial to Range Resources

The analysis of the effects upon range resource values of the completed projects was based on the opinions of project examiners as expressed on individual project reports, and amplified in the project area narrative reports. In the field inspections no attempt was made to determine the area affected by each project or the degree of effect on the area of influence. Each project was classified only as being either beneficial, neutral, or adverse in its effect upon resource values. On this basis it was found that 66 per cent of all projects completed were beneficial to soils, 69 per cent benefited the forage cover, and 80 per cent aided the management of these resources (see Chart 5). The preponderance of beneficial projects over those of neutral or of adverse effect on resource values is demonstrated on Charts 6a, 6b, and 6c. The adverse effects are analysed in more detail in a later section of the report.

Soil Values Aided Least, Management Values Most

Projects that retarded gully or sheet erosion, that slowed runoff waters and siltation, or in any way protected or improved the soil were considered beneficial to soil values. In practically every case where soils were benefited, vegetation and management also were helpfully affected, and in most cases the responses of vegetation and management were more rapid and more apparent than in the soils.

Vegetation values were gauged by the condition of the vegetative cover--its density, vigor and composition--and projects were considered to be beneficial if they improved one or all of these factors. The reports showed that a higher percentage of projects were found to be beneficial to vegetation than to soils. This relationship normally would be expected to follow from the well known fact that improvement in vegetative cover is not only correlated with improved soil values, but is more easily recognized.

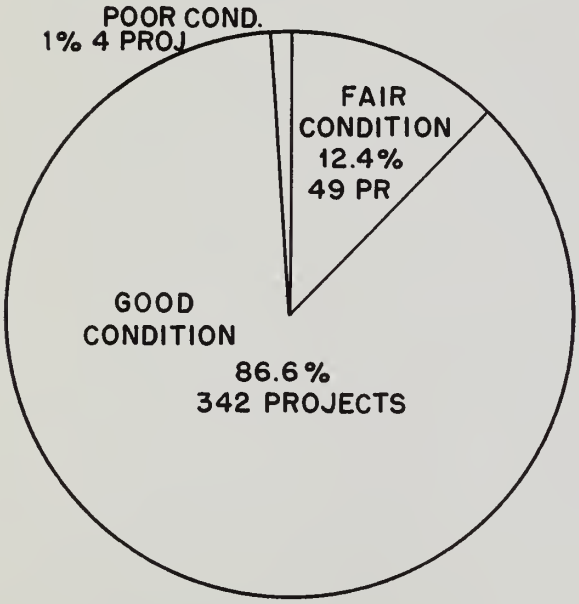
= CHART 4 =

PHYSICAL CONDITION IN 1948 OF SELECTED KINDS OF PROJECTS

RETENTION DAMS
979 PROJECTS

SPRING DEVELOPMENTS
323 PROJECTS

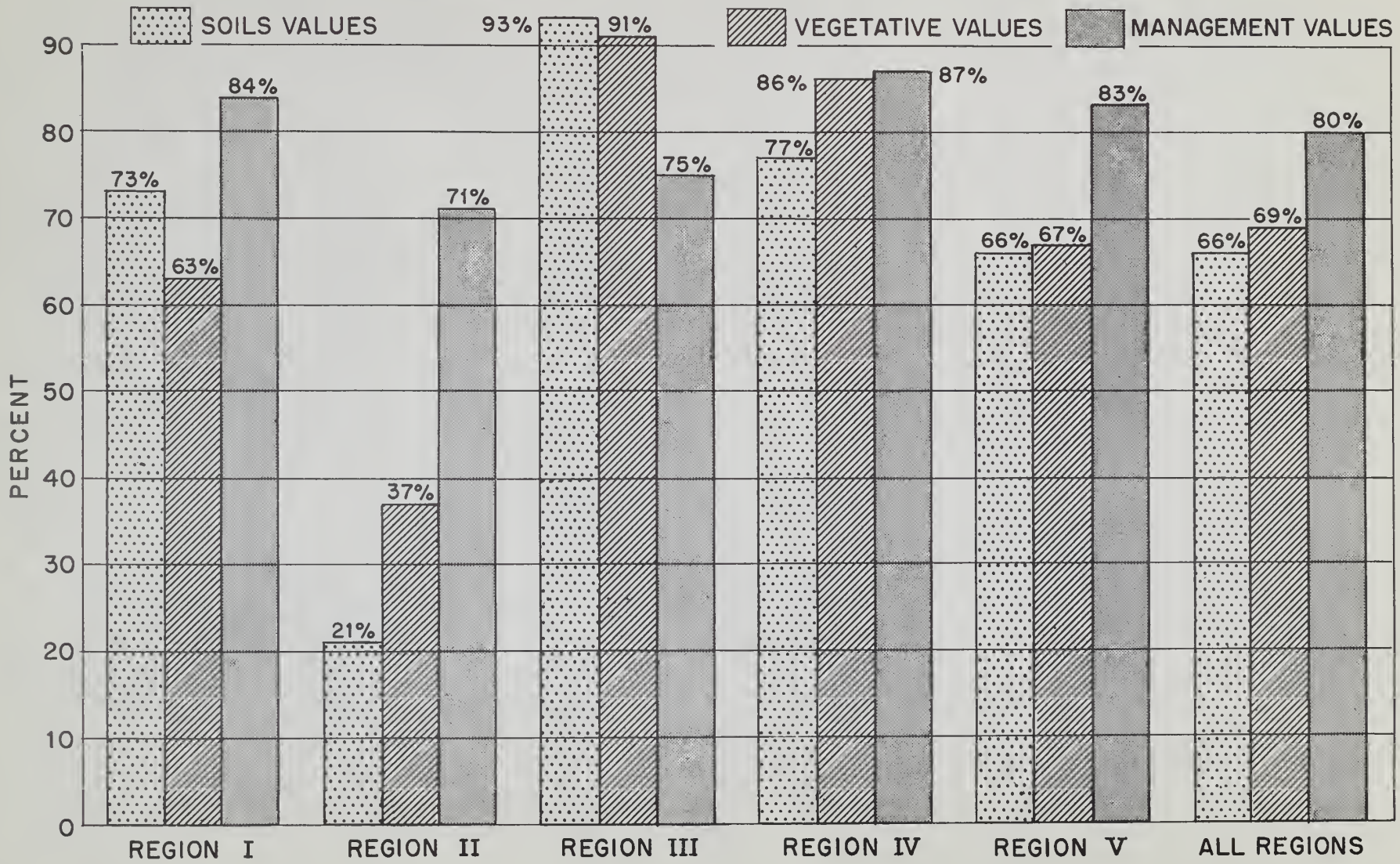
FENCE CONSTRUCTION
395 PROJECTS



ACCESS ROADS
76 PROJECTS

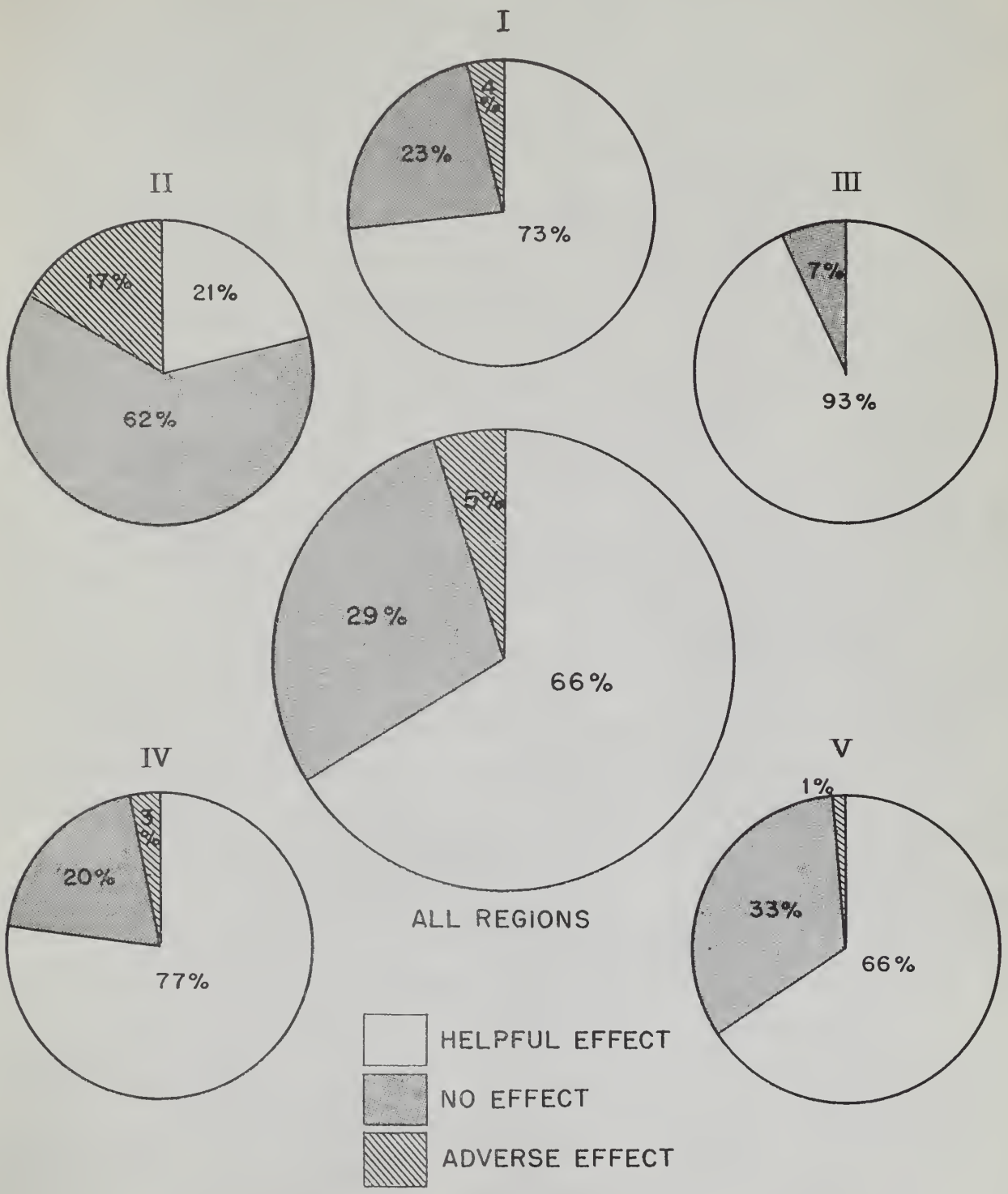
= CHART 5 =

PERCENTAGE OF PROJECTS FOUND HELPFUL TO SOIL VALUES, VEGETATIVE VALUES, AND MANAGEMENT VALUES IN THE FIVE GRAZING REGIONS



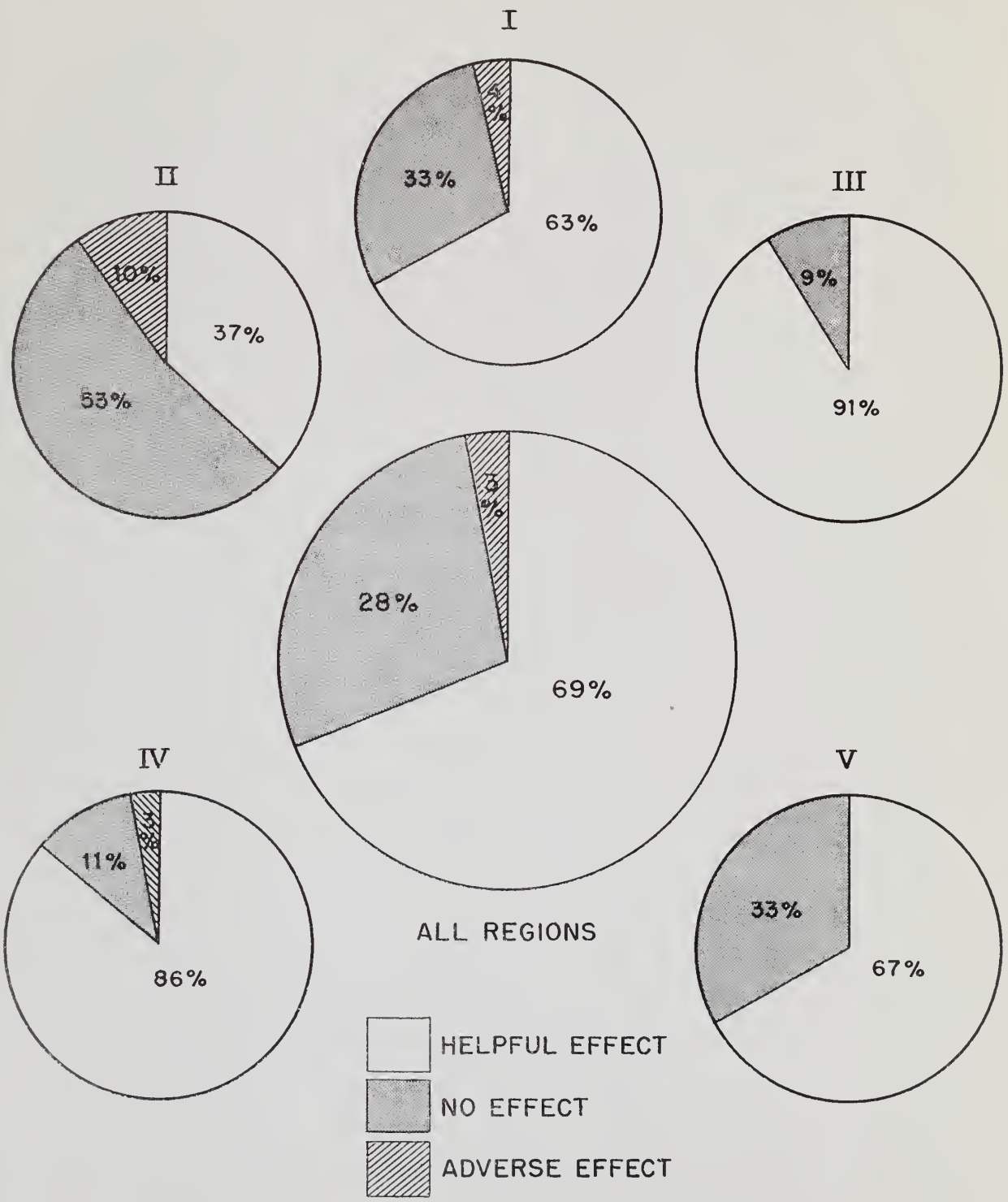
= CHART 6A =

PERCENTAGE OF PROJECTS FOUND HELPFUL, ADVERSE, AND OF NO EFFECT ON SOIL VALUES



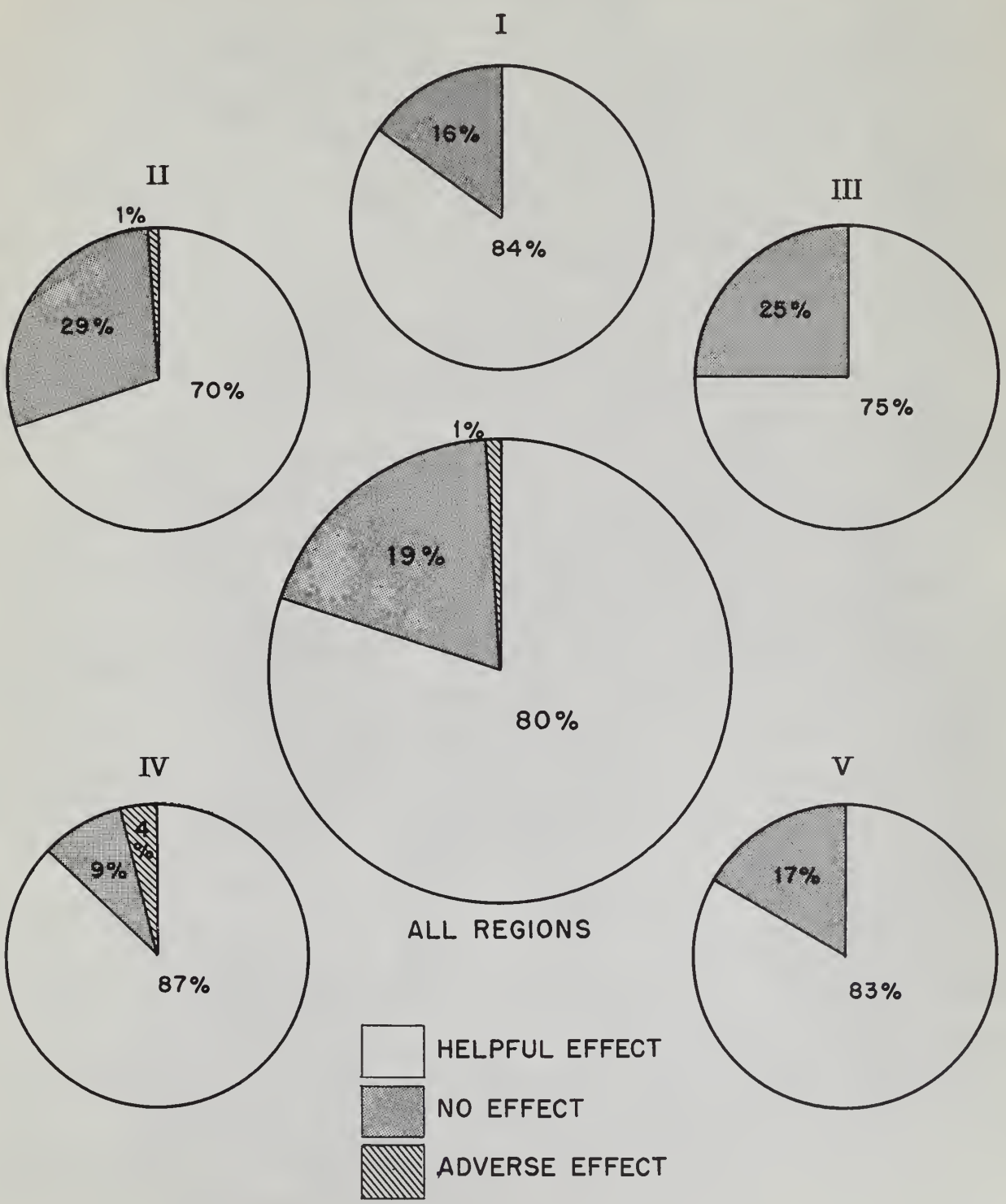
= CHART 6B =

PERCENTAGE OF PROJECTS FOUND HELPFUL, ADVERSE, AND OF NO EFFECT ON VEGETATIVE VALUES



= CHART 6C =

PERCENTAGE OF PROJECTS FOUND HELPFUL, ADVERSE, AND OF NO EFFECT ON MANAGEMENT VALUES



Management values were gauged on the basis of the effect of projects on the handling of livestock and the systematic utilization of the range resources. Helpful projects promoted better distribution of livestock and assisted in more even utilization, which in turn improved forage through proper utilization, and improved soils by maintaining a protective forage cover and reducing trailing and trampling. The numbers of all projects which benefited management as compared with the numbers that benefited soils and vegetation show that while these projects were constructed primarily to conserve soil and vegetation, they were at the same time equally or more beneficial to management. This is logical, since proper management goes hand in hand with all conservation practices and is in the long run the most essential factor in the conservation of resources.

Three Major Groups of Projects about Equally Beneficial

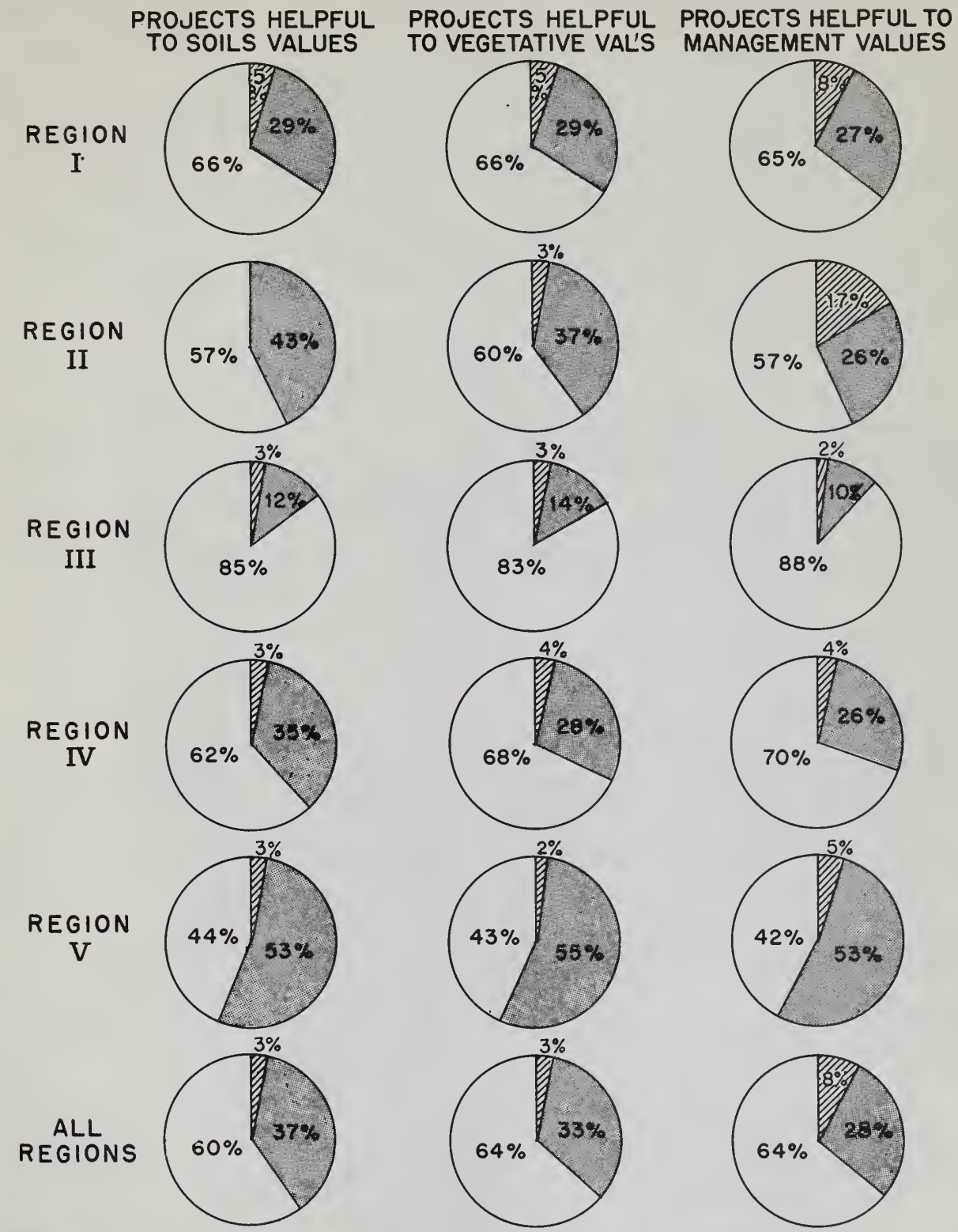
In deriving the relative effectiveness of projects completed upon range resource values only those projects which had shown definite reactions on these values were considered. Those projects which were new and had so far produced no effect were disregarded.

Beyond reasonable doubt, the greatest single factor influencing soil and vegetative resources on the bulk of the public domain is water. Over most of the areas here considered, vegetation is sparse due to low precipitation, especially during the growing season. Erosion control has been difficult because of the sparseness of vegetative cover on watersheds and the often damaging character of the precipitation that does fall. Livestock distribution, and consequently proper utilization, has been a problem because of the lack of livestock watering facilities. In view of these conditions it is natural that the majority of the projects have been devoted to water control, as illustrated in Chart 7. This chart shows that, of all projects having beneficial effects upon soil, vegetation or management values, 60 to 64% were water control projects, while in individual regions this figure varied from a low of 42% to a high of 88%. Vegetative control and protection projects accounted for roughly one-third of the total beneficial tallies, with individual regions ranging from a low of 10% to a high of 57%. Range use facilities showed generally minor contributions in the comparison of total projects beneficial to resource values.

The foregoing comparison does not indicate, however, that water control projects individually are more beneficial than individual projects of the vegetative control or range use facilities class. This is emphasized by Chart 8, which compares these groups on the basis of equal numbers of each. Nor does it necessarily indicate that more emphasis need be placed on the water control group. Vegetative control, for example, still is largely in the experimental stage, and eventually

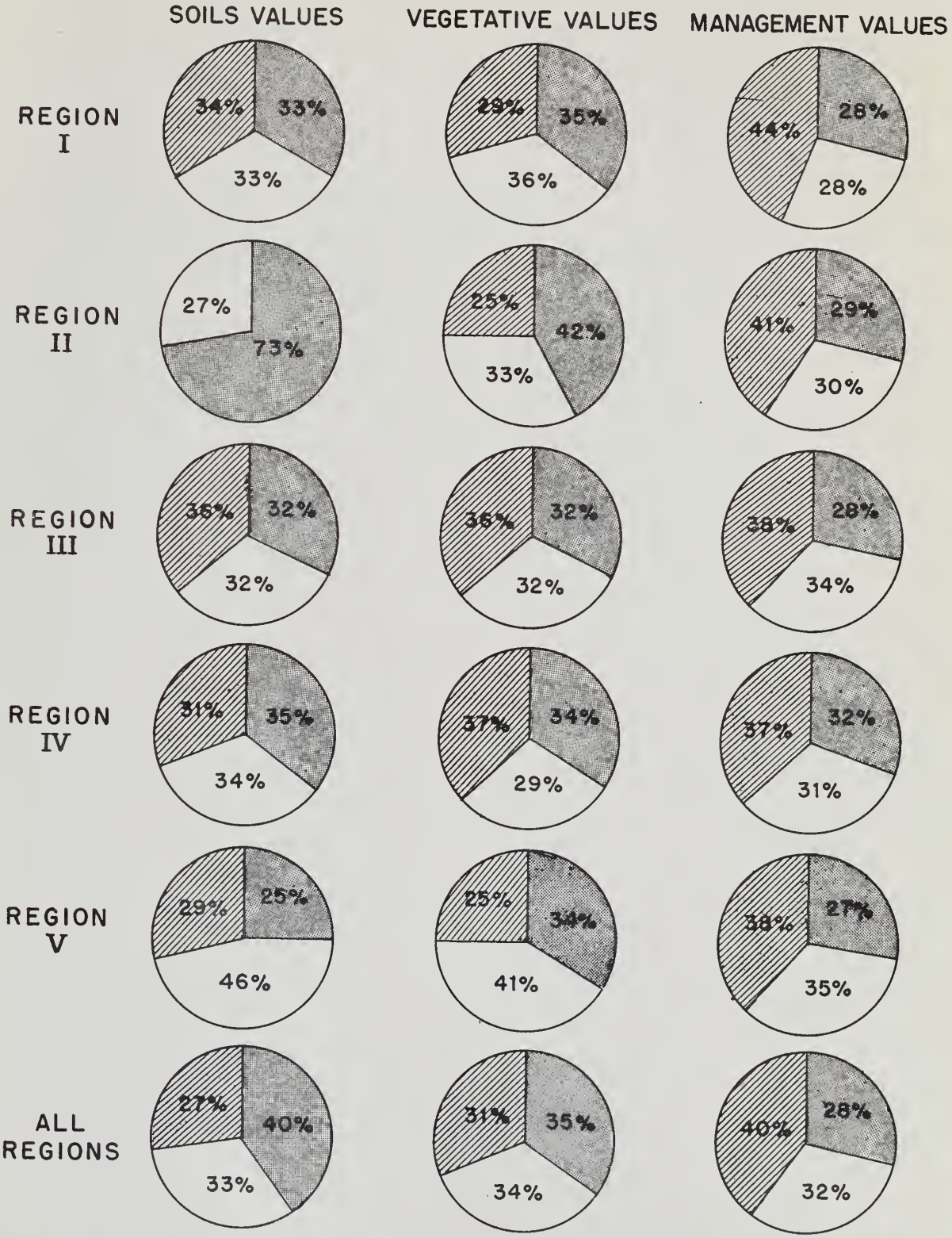
= CHART 7 =

CLASS OF PROJECT AS PERCENTAGE OF ALL PROJECTS HELPFUL TO SOIL, VEGETATIVE, AND MANAGEMENT VALUES



= CHART 8 =

INDEX OF BENEFICIAL EFFECTS FROM THREE CLASSES OF PROJECTS



may become more widely applicable than any other treatment. Again, the range use facilities group might logically contain a large share of the fences now shown in the vegetative control and protection group. As shown in Chart 8, the three groups as now constituted appear to be essentially equal in producing beneficial effects.

Vegetative Control and Protection Class Helps Basic Resources More than Management

The projects reported in the vegetative control and protection class consisted mainly of fences and reseeding. Based on the total numbers of projects reported this class contributed approximately one-third of all the projects giving beneficial effects to soils, vegetation, and management. It was about equally as effective as either the water control or range use facilities class when compared project for project.

The effectiveness of the vegetative control class in protecting and improving soil values was approximately equal to that of the other two classes of projects. Based on relative numbers of projects in each class, this class produced a little over one-third of the total projects beneficial to soil values, although there was considerable variation between regions. This variation in numbers of vegetative control projects between regions appears to stem from two main sources. First, some regions had the type of climatic conditions, soils and topography which do not readily lend themselves to present reseeding practices. Second, some regions gave first priority to proper management and distribution in attacking the conservation problem and consequently have invested more heavily in fences than other regions.

Vegetation apparently derived about as much, but no more, benefit from the vegetative control and protection projects as it did from equal numbers of projects in other classes. Furthermore, on the basis of the total number of projects in each class, vegetation reflected approximately the same beneficial effects from the vegetative control class as did soil. It is apparent that soils and vegetation are so closely related that what affects one is bound to affect the other.

There were fewer projects in the vegetative control and protection class that were beneficial to management than there were of projects that benefited soils and vegetation. Several projects such as tree planting and check plots were of no benefit to management. The effects were so slight or slow to become evident from projects such as rodent control that they may not have been recognized. A comparison of projects of this class with equal numbers of projects in the other classes revealed that it had slightly less value to management than the range use facilities class, but was about equal to the water control group.

Water Control Class Carries Weight by Numbers

The most numerous projects in the water control group were, in order, retention dams, spring developments and wells. Other developments such as water spreading, contours, streambank protection and so forth were shown to be equally effective for the most part as individual projects, but were represented in far smaller numbers. There are several logical reasons for the difference in numbers of individual kinds of projects in this group. In the case of reservoirs or retention dams numerous suitable sites are available for their construction in most areas. They may be built cheaply and in general are effective and positive. They have failed in relatively few cases and require little maintenance. Wells and spring developments, while expensive compared to reservoir construction, are positive sources of good water, generally speaking, and have proven their value through centuries of use. Conversely, most of the other kinds of projects in this group are relatively new and have not proven their value over such a long period of time. They have been expensive to construct in the past with available equipment and engineering methods. Many of them require constant observation and continual maintenance. In many instances these projects have been in the minority because it has been possible to construct them only on specific sites where the topography and soils are suitable, and these favorable locations are rare.

As in the case of vegetative control and protection projects, there are wide variations between regions as to comparative numbers of water control developments. There are two outstanding reasons for this, (1) in some cases administrators saw a need for improving livestock distribution and control prior to initiating water control measures, (2) some areas were naturally adapted by reason of climate, soils, and topography to the water control approach to resource conservation, whereas others were similarly adapted to other approaches.

For reasons set forth earlier, the water control projects as a class have far outranked other classes of developments in numbers and consequently in total effect on soils, vegetation, and management. However, a comparison of equal numbers discloses that water control projects have been no more effective than either vegetative control or range use facilities projects.

Thus far, there have been nearly twice as many projects in the water control class that gave beneficial effects to the soils values, as the combined numbers of those in the vegetative control and protection class and those in the range use facilities class. Yet projects in this class compared with equal numbers of projects in either of the other two classes showed no greater benefits.

The effect of projects in the water control class upon vegetation values has very closely paralleled the effects of this class on soils values, both on the basis of existing numbers and in comparing equal numbers of projects in all classes. This parallel effect, as previously noted, is due to the interdependency of soils and vegetation, with the same treatment causing similar reactions in both resources. The variance between regions is due to the same causes outlined in the preceding paragraph on the relative effect of water control projects on soils.

Projects in the water control class bear approximately the same relationship to management values both in relative numbers and relative value as they do to soil and vegetation values. Many of the water control projects such as spring developments and wells are as beneficial as range use facilitating projects in their effect on management values, since they automatically aid in livestock distribution and proper range use, regardless of the end purpose for which they were undertaken. Many projects of this class, taking retention dams for example, although they are constructed to impound flood waters and retard excess runoff, serve the dual purpose of supplying livestock waters in the same manner as spring developments and wells.

Range Use Facilities Few, but Compare Well.

The range use facilities class of projects is composed of those projects which are constructed to control and facilitate the handling and distribution of livestock and the proper management of the range. The most numerous projects in this group are corrals and access roads. Because of the smaller numbers of projects involved, this class produced relatively few total projects which were beneficial to resource values, compared with the other two classes. In general, there are fewer of these projects needed to service an area than projects of other classes. For example, an access road twenty miles long may pass twenty or thirty reservoirs, several wells, springs and fences and several reseeding areas. Individual projects of this class have been equally as valuable to resource conservation as have projects of the other classes. However, many of them are potentially adverse, as in the case of corrals which may cause abnormal concentrations of stock.

The percentage of range use facilitating projects beneficial to soils was only slightly below the percentages of beneficial projects in other classes. In some regions where fire hazards were greater the need of access roads has enhanced the value of this group for this purpose.

Range use facilities had about the same effects on vegetative values as on soils. Here again one of the greatest benefits was in fire protection. The main point to be made here is that this class of projects did demonstrate value in resource conservation and, project for project, appeared to be as valuable as any other class.

There were considerably more projects in the range use facilitating class that were beneficial to management than there were projects beneficial to either soils or vegetation. This was to be expected since these projects are primarily adapted to assist management in improving resource values through grazing control. Comparing equal numbers of projects of each class further emphasized this relationship.

Effectiveness of Projects Depends on Application, not Kind of Project

The preceding section of this report has considered classes of projects and their relative effectiveness in the conservation of range resources. It is the purpose of this section to make a similar evaluation of some individual kinds of projects from each class. The kinds selected for this purpose were those which were represented by the largest numbers examined and reported in each class. These were reseeding and fencing in the vegetative control and protection class; retention dams and spring developments in the water control class; and corrals and access roads in the range use facilitating class.

Most of the projects produced beneficial results in soil, vegetation or management values and consequently those constructed in the greatest quantity provided the largest number of beneficial results (see Chart 9). However, when compared on the basis of equal numbers no particular kind of project was outstandingly superior or inferior to any other in producing beneficial effects on resource values (see Chart 10), though there were some variations. In other words, any kind of project contributes value as a conservation tool mostly through the way in which it is used. Proper planning of use and location, taking advantage of situations to which a given project is particularly well adapted, and following its construction with adequate maintenance and proper management, are of paramount importance.

Seeding and Planting Results Indicate Need for More Study

Reseeding is one of the important kinds of projects in the vegetative control and protection group. It also ranks high among over-all accomplishments of the S&M program. In weighing the effect of seeding and planting on soil, vegetation, and management values, it is assumed that successful and moderately successful operations gave helpful effects to all values, in varying degrees. For the poor to failure operations a neutral effect may be expected, and possibly beneficial effects on one or more values to a limited degree. Some adverse affects also have occurred.

CHART 9

PERCENTAGE OF SELECTED KINDS OF PROJECTS BENEFICIAL TO SOIL, VEGETATIVE, AND MANAGEMENT VALUES

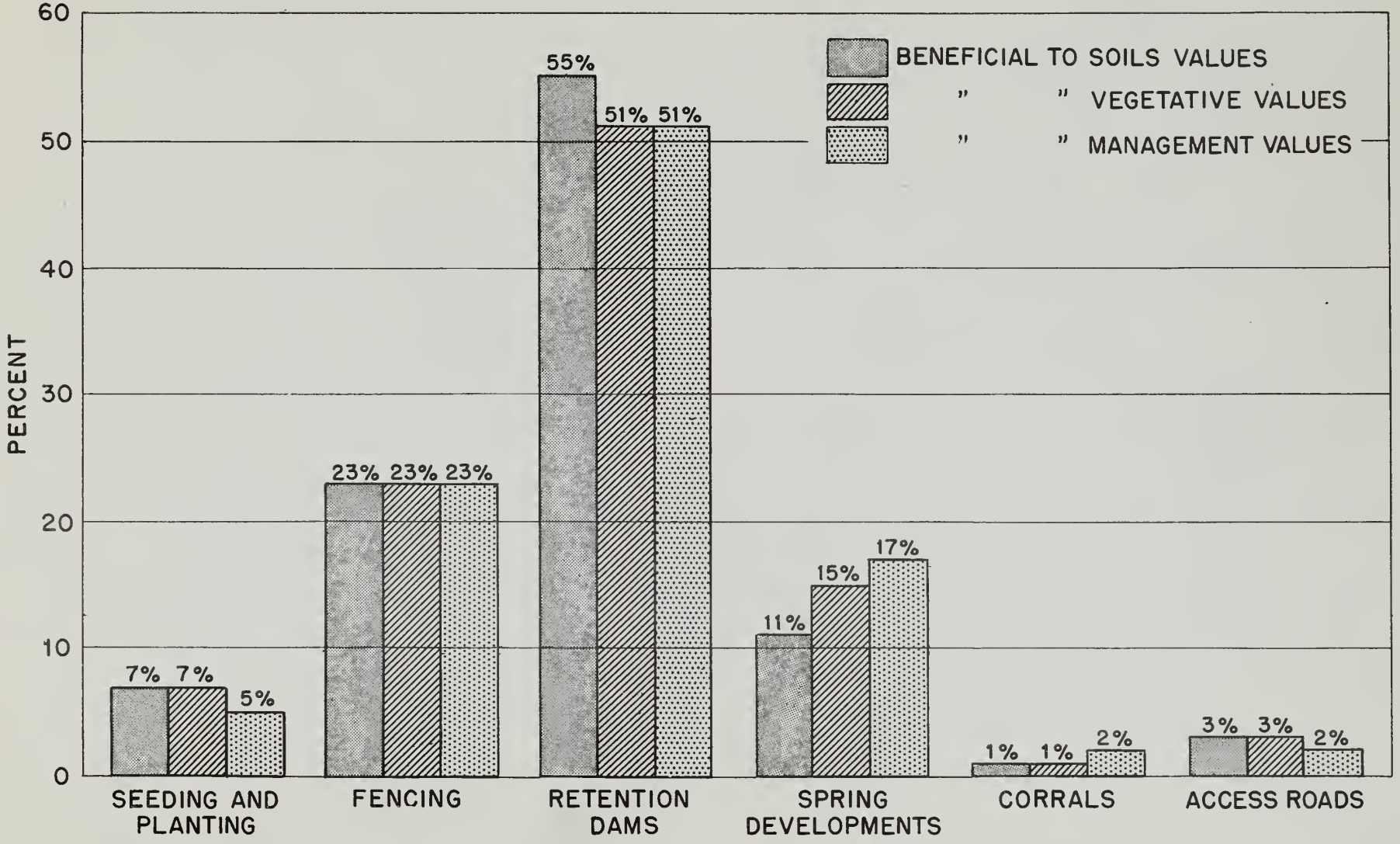
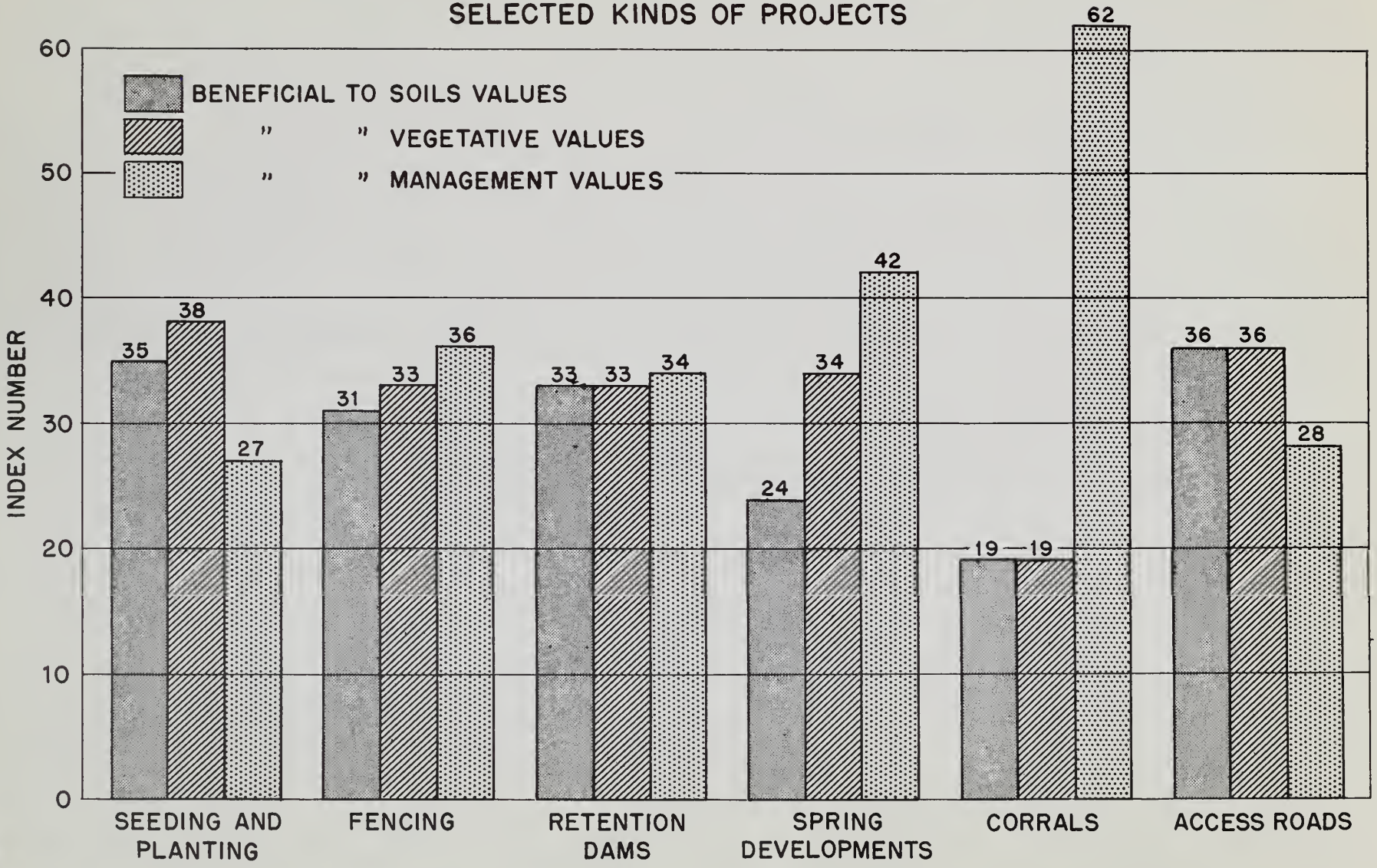


CHART 10

INDEX OF BENEFICIAL EFFECTS FROM SELECTED KINDS OF PROJECTS



Results of reseeding projects were obtained from the examiners' descriptive opinions expressed in the field reports. Some variance was noted between examiners in the estimation of degree of success or failure, but not enough seriously to affect the over-all grouping into the three degree classes used.

Chart 11 compares acreages of most types of reseeding projects so far used in the Bureau's conservation program. Aerial pellet reseeding done to date (calendar years 1947 and 1948) has not had time to give a conclusive performance record, and therefore was omitted from the analysis although included in the total acres of reseeding shown in Appendix Tables II and II-A. Chart 11 also summarizes the effectiveness of the total acreage shown, with roughly 27% in the poor to failure category and nearly 73% in the success status.

Charts 11a, and 11b present further comparisons of results obtained from the various types of reseeding operations. In general these charts support the accepted dictum that reseeding results may be expected in proportion to the degree of seed bed preparation and seed coverage applied. Thus, broadcasting without seed bed preparation on 24,718 acres in 18 projects gave, on an acreage basis, 50% poor to failure, 46% moderate success, and only 4% of definite success. By comparison, when railing or dragging was added to the operation on 35,123 acres in 10 projects, definite success was secured on 44% of the total area and moderate success on an additional 32%, with poor to failure results reduced to 24%. Similar improvement was noted from discing or plowing in connection with broadcasting on 26,512 acres in 17 projects, 40% of the acreage being successful, 26% moderately successful, and 34% poor to failure. The very high degree of definite success reported--(82.5%)--and low degree of poor to failure results --(5%)--shown by aerial broadcasting of naked seed on 19,844 acres in 4 projects is not thought to reflect accurately the relative reliability of this method, as it is influenced by conspicuous success on two large areas which contained most of the total acreage. It does show, however, that this method should not be dismissed as too unreliable to justify its continued use, and suggests rather that more careful study be made of the conditions under which successes have been secured.

Results from the various drilling operations (Chart 11b) reflect the general dependability of this method, as well as the apparent advantages of seed bed preparation. The relatively poor results shown where seed was drilled on untreated land do not accurately reflect the success generally possible from this method. In at least two instances substantial acreages failed completely for unexplained reasons not thought to be chargeable to the method.

CHART 11

RESEEDING OPERATIONS
- ALL PROJECTS -

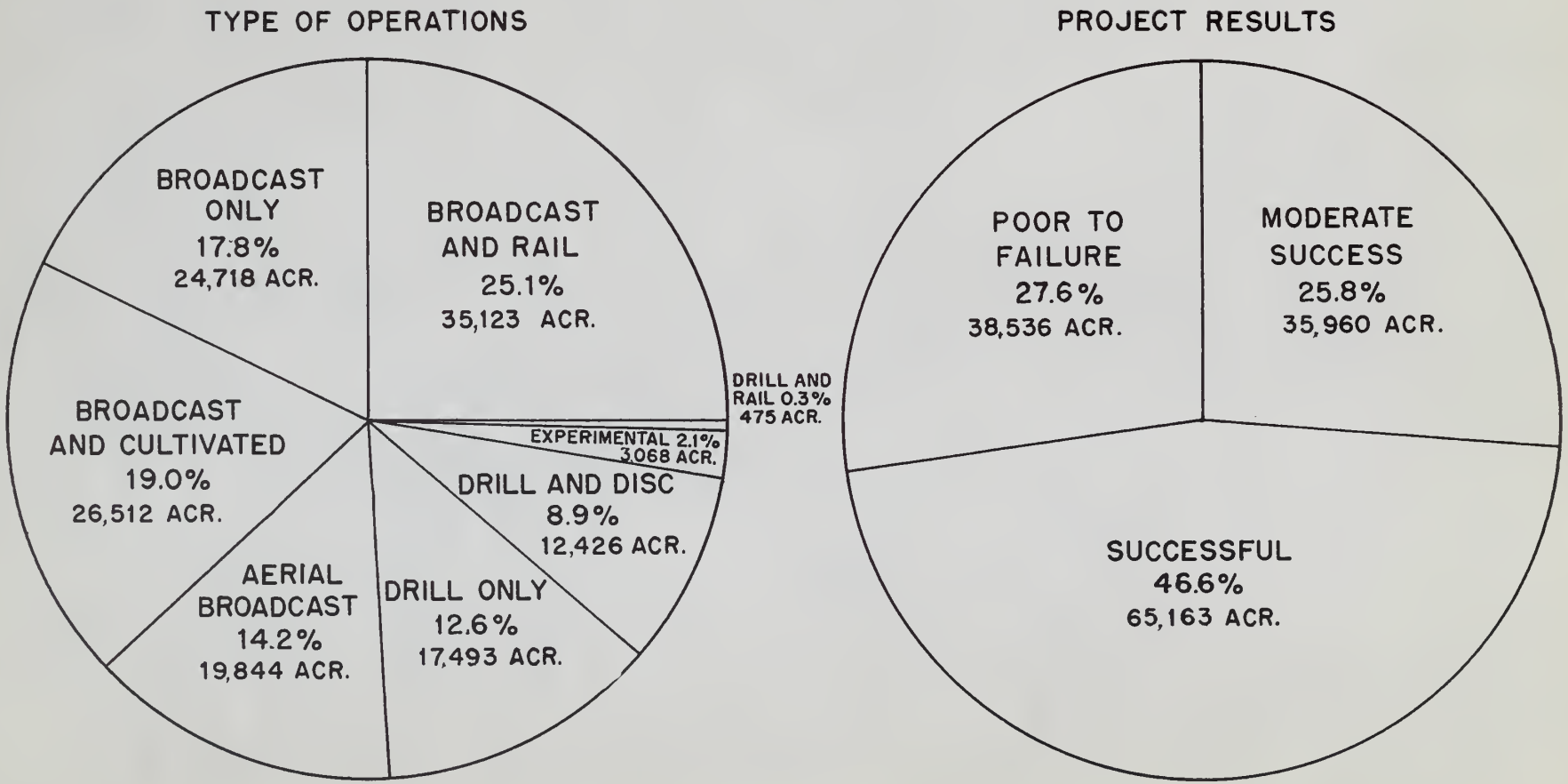
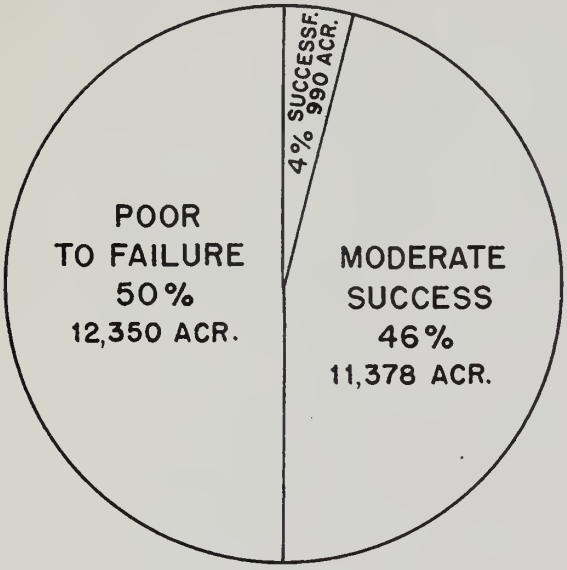


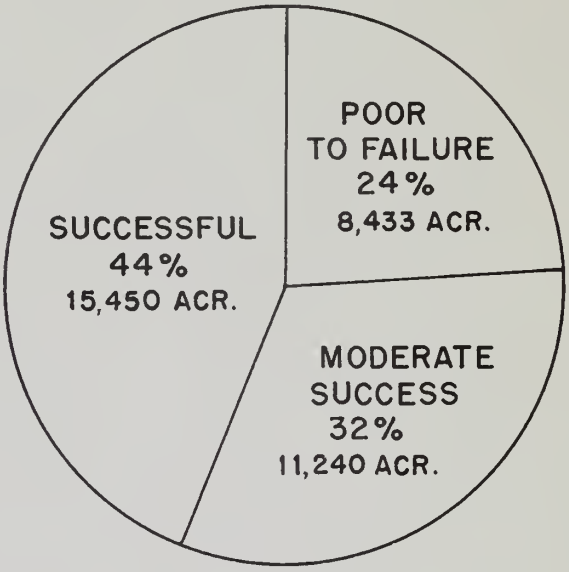
CHART 11A

RESULTS OF RESEEDING OPERATIONS

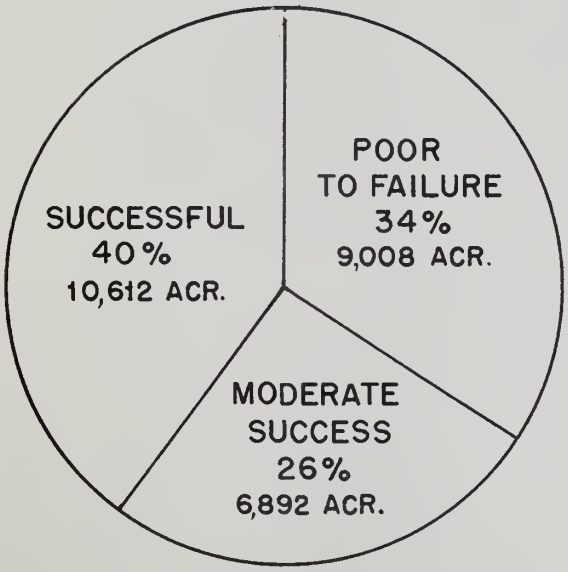
SEED BROADCAST ONLY
HAND OR MACHINE
24,718 ACRES



SEED BROADCAST AND
RAIL OR DRAG
35,123 ACRES



SEED BROADCAST
DISC OR PLOW
26,512 ACRES



AERIAL RESEEDING
NAKED SEED ONLY
19,844 ACRES

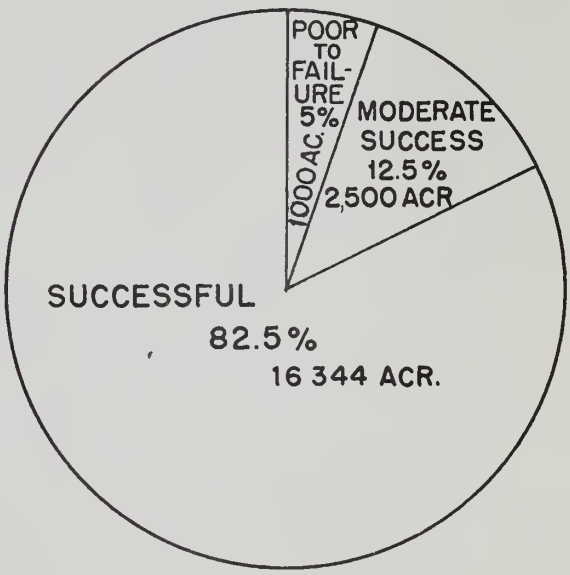
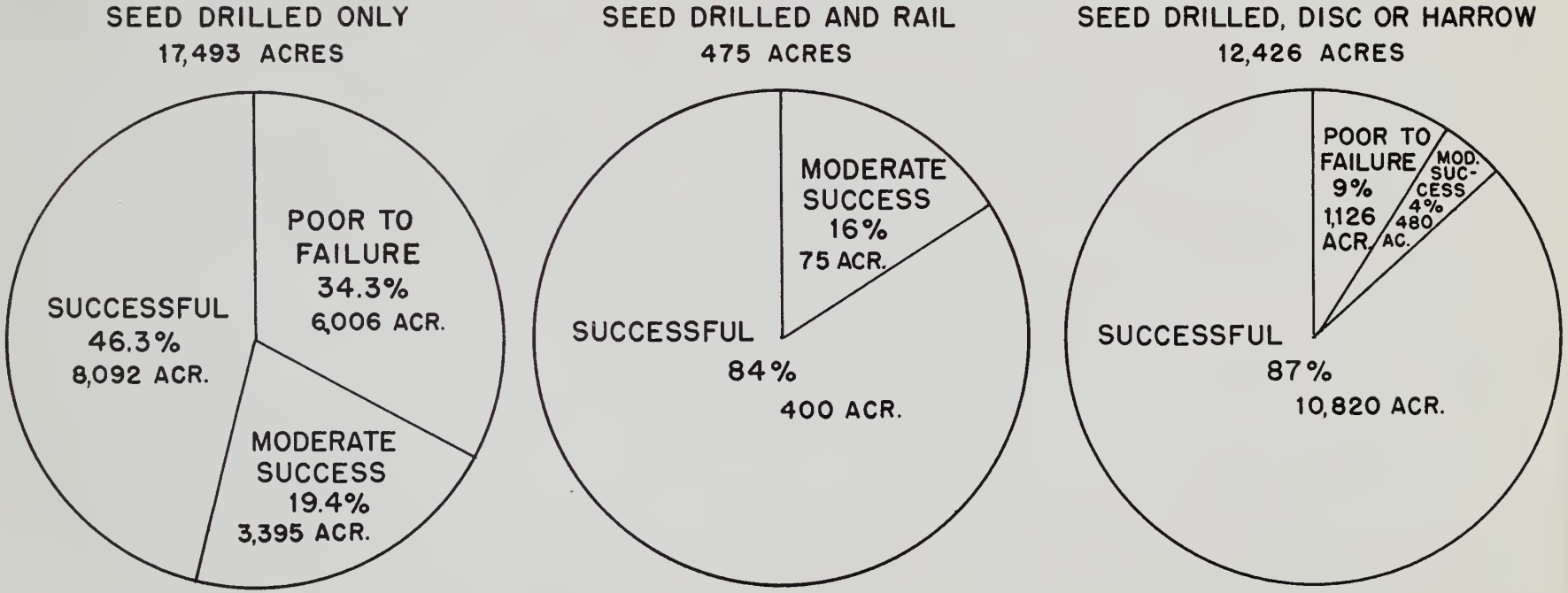


CHART 11B

RESULTS OF RESEEDING OPERATIONS
- SEED DRILL PROJECTS -



In comparing broadcast and drilled seeding results, cognizance should be taken of the fact that broadcasting generally is resorted to on lands of lower productive potential than those suitable for drilling, and that densities of catch termed successful in a broadcasting operation often would be rated lower on a drilled seeding. On the other hand, in several instances broadcast seedings have given stands fully comparable with those secured by drilling. Here again, the results suggest more careful study of the success, since the broadcast method can reach large acreages not suitable to drilling.

Fences Hold the Line--and the Resources

Fences normally fall in two groups, (1) enclosure fences to keep livestock on a particular area, typified by the fences used in rotational grazing systems, and (2) protection fences to keep livestock out of an area, such as those fences constructed to protect reseeding projects. Those in both groups are good conservation measures in protecting range forage and controlling its use. In beneficial effects fences apparently represent approximately the average of the index values shown in Chart 10.

Fences were only slightly less beneficial to soils than to vegetation and management. Their main value to soils is derived from the protection they afford to the forage cover which protects the soil from excess runoff waters and wind. Range vegetation values are benefited by fences through enforced better distribution of grazing use, allowing the plant cover to develop normally, and protecting it against abusive grazing practices. The value of fences in benefiting management lies, of course, in their positive control of livestock movements. The fact that this type of project is more helpful to management than to either soils or vegetation is not surprising since fences are constructed to control the movement of grazing animals and thus have a direct effect on management and an indirect effect on natural range resources. The smallness of this difference is surprising in view of the common assumption that fences are chiefly justifiable as management aids.

Retention Dams Top the List in Beneficial Effects

Retention dams correspond with the exact average index value of all kinds of projects compared on Chart 10 in their beneficial effects on soils, vegetation, and management values. However, more total projects helpful to these three values fall in this kind than in any other single kind. Retention dams are unique in having a direct effect on all three values examined. They catch and retain excess runoff waters which would otherwise be destructive to both soils and vegetation below, and hold these waters for the use of domestic livestock. They improve the distribution of livestock and retard the flow of silt.

Retention dams have provided a slightly higher number of projects which benefited soil values than those which benefited the values of vegetation and management for the reason that many retention dams have been constructed purely for the purpose of retarding silt flow or stopping head-cutting of gullies. Vegetation and management values have received beneficial effects from about the same numbers of projects of this kind.

Spring Developments Help Management Most

More spring developments have contributed beneficial effects to all three resource values than any other kind of project examined except retention dams and fences. They are the finest kind of livestock water and are usually dependable. Therefore, their development is highly encouraged where springs are available. Their chief function is in improving livestock distribution, which is the reason for their value in resource conservation. Comparing them with equal numbers of the other kinds of projects discussed they have slightly less value to soils, and more value to management.

It has been pointed out that spring development projects are less valuable to soils on the average than others discussed, except corrals. This is undoubtedly related to the fact that they have no direct effect on soils, but impart benefit by influencing the movement and distribution of livestock. Vegetation values receive as much benefit from spring developments as from the other kinds of projects, and are more benefited by this kind than soils. As the vegetation must be improved by these projects before the soils show response, and the effects on vegetation become apparent more rapidly, the question arises as to whether the soil may not eventually receive as much help as the vegetation. Due to the direct effect of stock water on management these projects have produced more noticeable beneficial effects on management than on soils or vegetation.

Access Roads Aid all Other Developments

Project reports indicate that fewer access roads have been constructed than retention dams, spring developments, fences,and reseeding projects, but point out that on the average these projects have contributed beneficial effects to resource conservation as often as any other kind. Access roads benefit range resource values primarily in making areas accessible to work crews, fire fighters, and stockmen. They are valuable also as fire breaks.

They allow workmen to get into areas and construct other types of improvements which have a direct effect on soils, and allow fire crews to operate more efficiently in protecting the vegetative cover which protects the soil. They help open new areas to grazing thus relieving grazing pressure on overstocked areas. By these same means access roads benefit both soils and vegetation about equally, and management to a lesser degree. Management has benefited greatly by being enabled to make closer inspection of resources and of grazing practices on the range.

Corrals of Benefit Chiefly to Management

Of all six types of projects discussed here, corrals have contributed the least to resource values. Corrals have been constructed in smaller numbers than the other types because there are fewer situations where this development can be used advantageously, and more situations where they may be definitely adverse. Properly planned, installed and used, they can be very beneficial. For example, where stock must be held for shipment or treatment corrals limit the abuse of range forage and soils to a small area. Also, many corrals serve as loading points which reduce damage by eliminating extensive trailing formerly practiced.

Corrals give direct benefits to management and are constructed primarily to assist in the handling and control of livestock. It is logical therefore that this type of project should be more beneficial to management than to soils or vegetation.

What Causes an Inferior Project?

The analysis of the physical condition of projects (Chart 3) indicates that 26% of the existing projects are in the inferior condition class, as indicated by "fair" and "poor" ratings in the field reports.

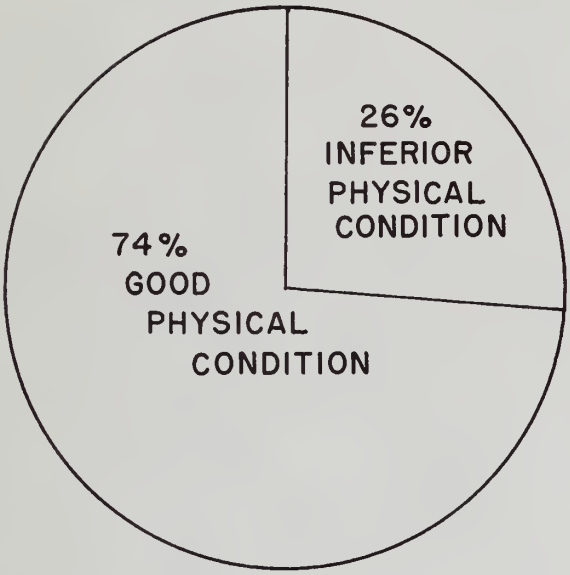
In reporting condition of projects, each examiner gave his opinion of cause for the inferior classification. These causes have been classified as follows: 1. Inadequate planning, 2. Inadequate structure or method, 3. Inadequate maintenance, 4. Improper use, 5. Normal depreciation, and 6. Other causes. Other causes include drought, flood conditions, industrial activities, etc. No account was taken of projects abandoned prior to the report.

In conjunction with the consideration of the physical condition of projects it is well to keep in mind the relationship between the condition of the projects and their effective values (Chart 12). Most projects in fair condition were effective to some degree irrespective of their physical condition. Chart 12 also compares the causes of inferior physical condition and failure to aid resource values. It

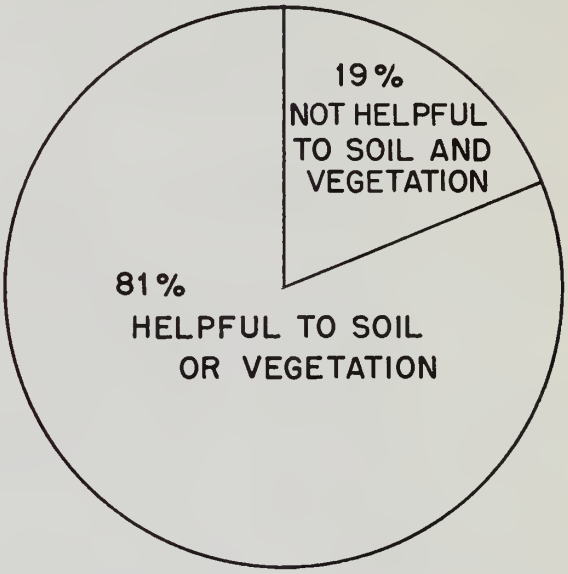
CHART 12

REASONS FOR INFERIOR CONDITION AND INEFFECTIVENESS OF PROJECTS

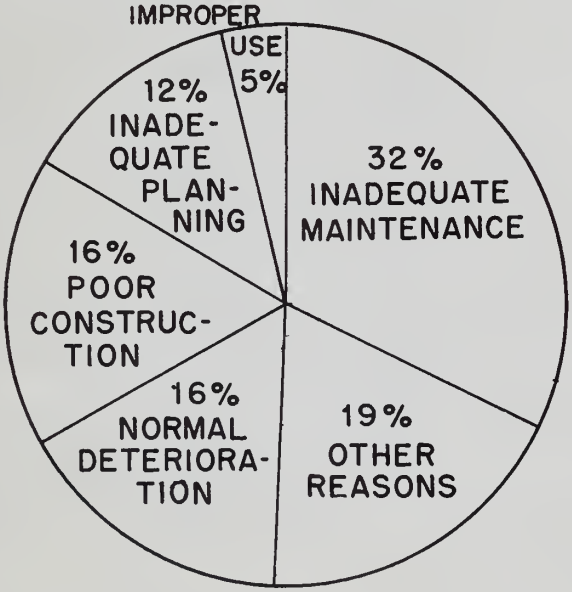
TOTAL PROJECTS



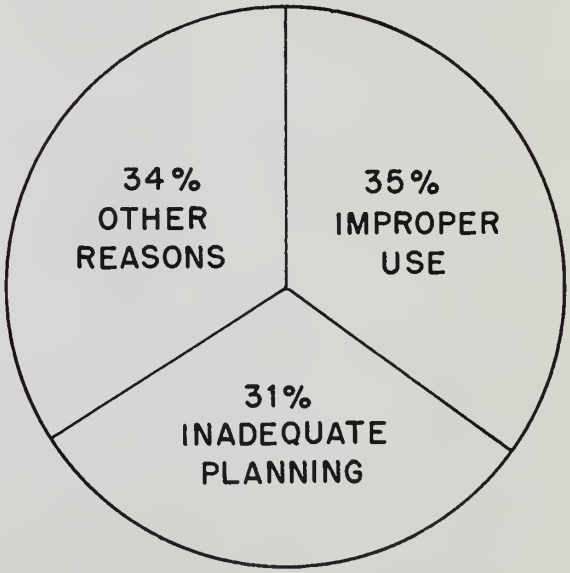
TOTAL PROJECTS



REASONS FOR INFERIOR PHYSICAL CONDITION



REASONS FOR FAILURE TO AID SOIL AND VEGETATIVE VALUES



is apparent that proper planning, and correct use are the keys to successful application of a soil and moisture conservation program, and further that the program must be based on well constructed and adequately maintained projects.

Chart 13 gives an interesting comparison between the poor condition class and fair condition class of projects. Inferior conditions are most prominent in the poor class because of inadequate structure (27.35%), inadequate planning (23.1%), and inadequate maintenance (21.9%). For the fair condition class, inadequate maintenance (39.2%) and natural deterioration (25.6%) are the dominating factors. This shows that deficiencies in initial or primary steps were responsible for 50% of the poor class of projects, with lack of an adequate follow-up by maintenance in an additional 21% of this class. No other single cause was prominent.

For the fair class of projects, inadequate maintenance and natural deterioration total 64% of cause, this indicating that lack of annual repair and processes of natural depreciation caused the greater losses in physical condition.

A combined analysis of the fair and poor classes (Chart 13) gives the following breakdown for cause of inferior condition: inadequate maintenance first with 32% of total cause, inadequate construction and natural deterioration with 16% each, inadequate planning 12%, improper use 5%, and other causes 19%. This study of causes for inferior conditions clearly shows the necessity for proper planning and construction standards, with the need of maintenance appraisals and annual follow-up to relieve these conditions.

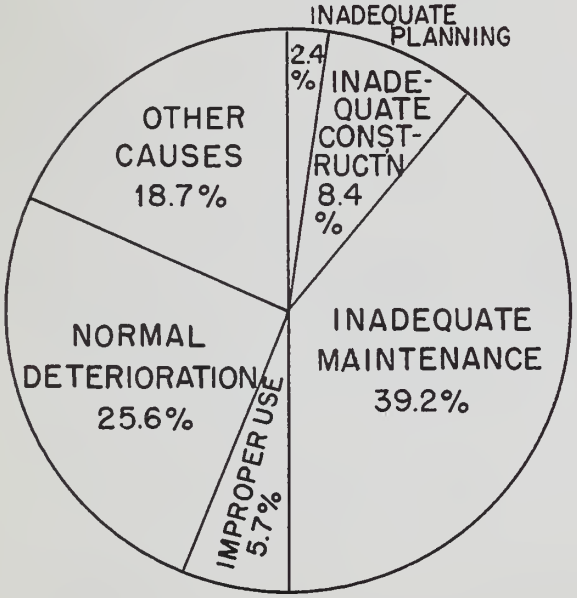
Charts 14a, 14b, 14c, and 14d are studies of selected types of projects and the cause of inferior conditions for each. It is interesting to note that in the retention dam and spring development projects, inadequate maintenance again is prominent in cause, with the remaining factors shown in smaller degrees for the fair class, while the poor class indicates an almost parallel picture. On fence and truck trail projects this study shows that for the fair class normal deterioration is consistently high, with inadequate maintenance following. In the poor group a reverse is noted, with inadequate maintenance extremely high, with small percentages from inadequate planning for truck trails, and with other causes in fence construction.

Causes of inferior results of selected types of reseeding projects (Chart 15) indicate that, wherever feasible, some seed bed preparation is advisable for a reasonable degree of success. This chart shows that where seed was broadcast with little or no soil preparation this cause alone was heavily responsible for inferior results, with planning, natural causes and improper use relatively small in comparison. Where

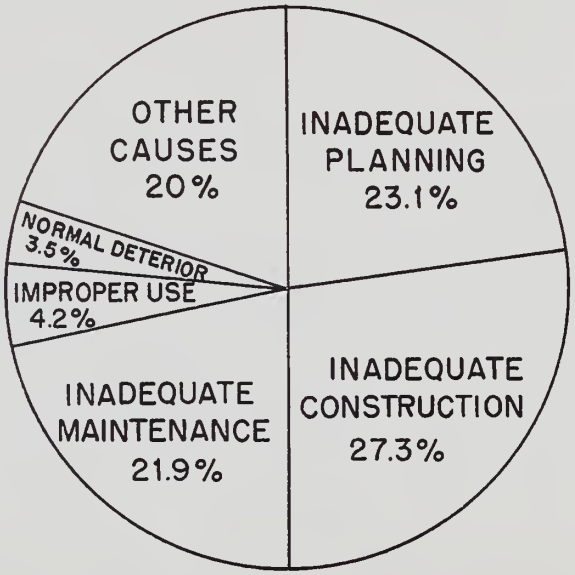
= CHART 13 =

REASONS FOR INFERIOR CONDITION OF PROJECTS

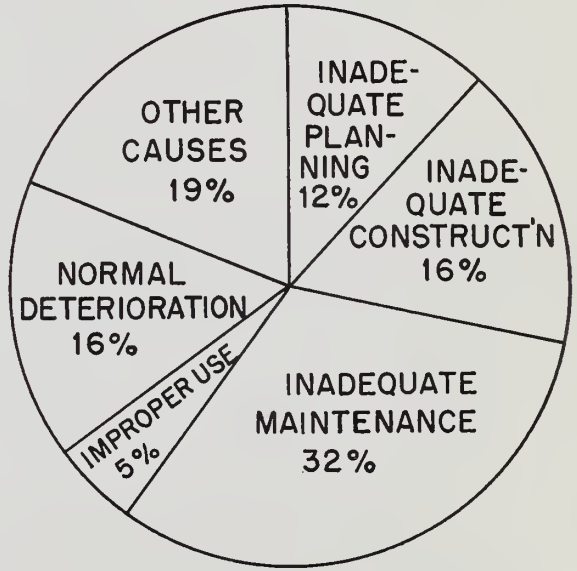
FAIR CONDITION CLASS
330 PROJECTS



POOR CONDITION CLASS
260 PROJECTS

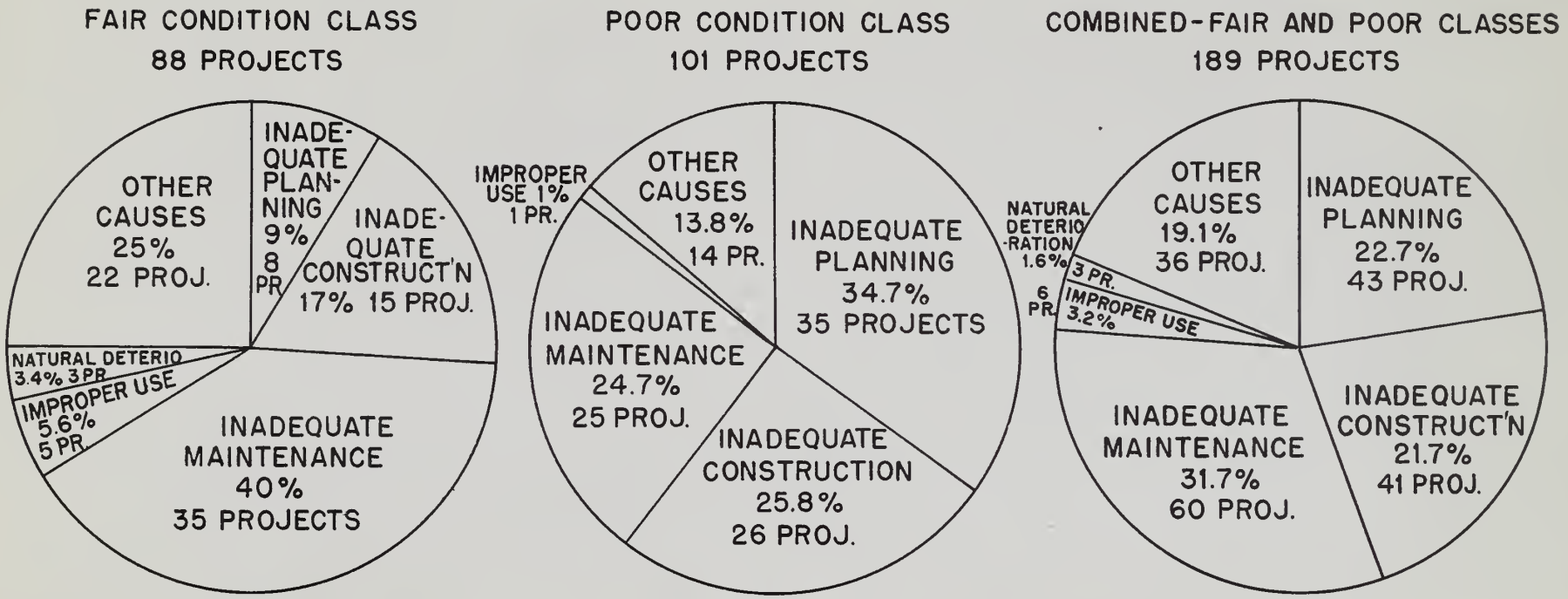


COMBINED-FAIR AND POOR CLASSES
590 PROJECTS



= CHART 14A =

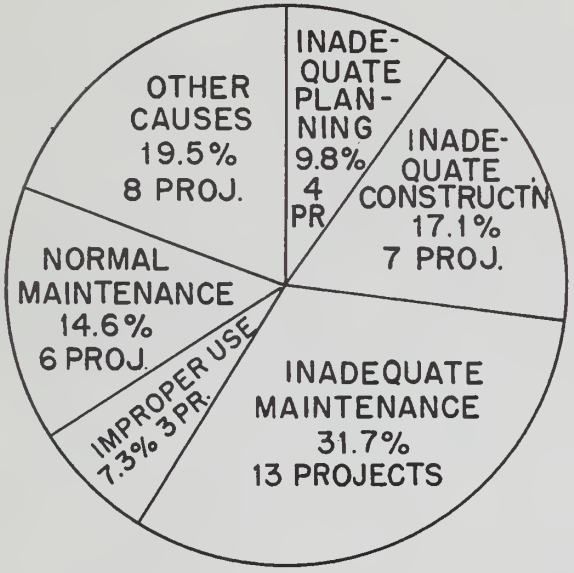
REASONS FOR INFERIOR CONDITIONS OF SELECTED TYPES OF PROJECTS
- RETENTION DAMS -



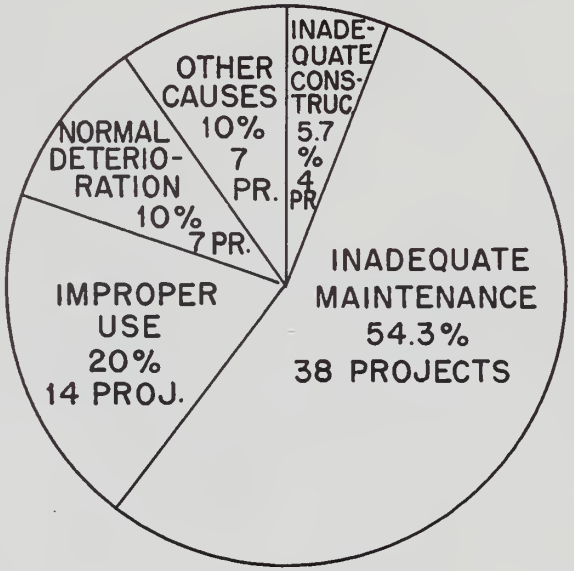
= CHART 14B =

REASONS FOR INFERIOR CONDITIONS OF SELECTED TYPES OF PROJECTS
- SPRING DEVELOPMENTS -

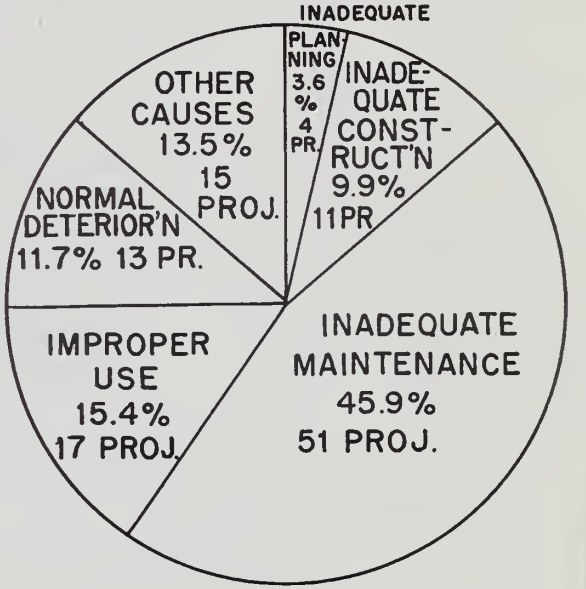
POOR CONDITION CLASS
41 PROJECTS



FAIR CONDITION CLASS
70 PROJECTS



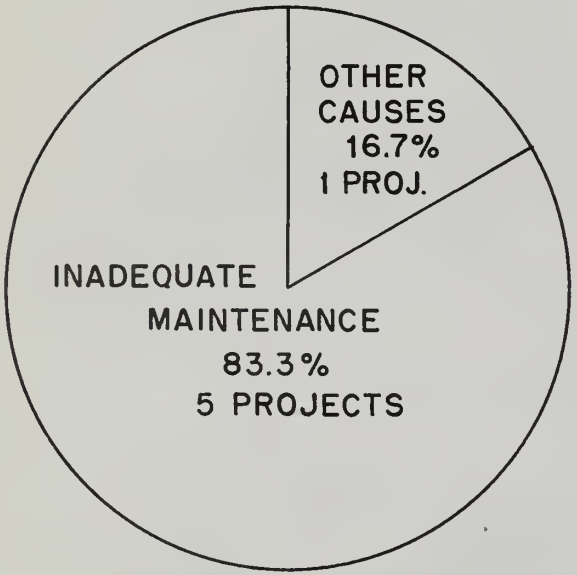
COMBINED - FAIR AND POOR CLASSES
111 PROJECTS



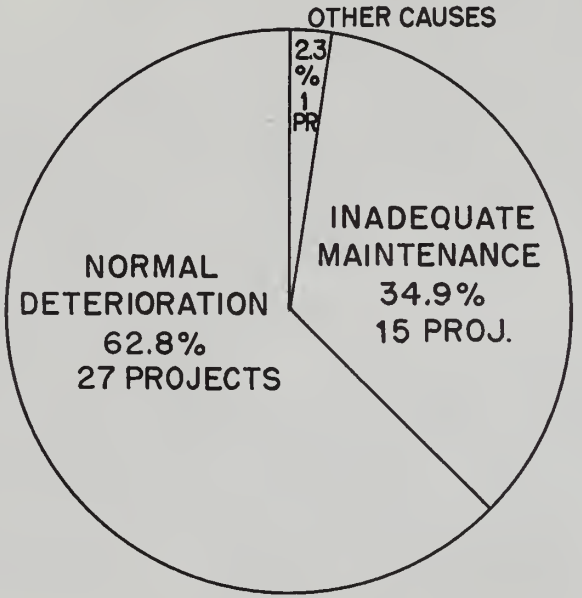
= CHART 14C =

REASONS FOR INFERIOR CONDITIONS OF SELECTED TYPES OF PROJECTS
- FENCE PROJECTS -

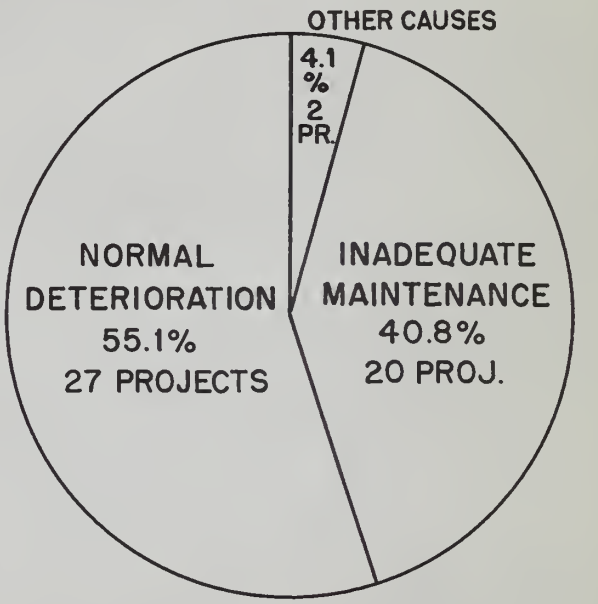
POOR CONDITION CLASS
6 PROJECTS



FAIR CONDITION CLASS
43 PROJECTS



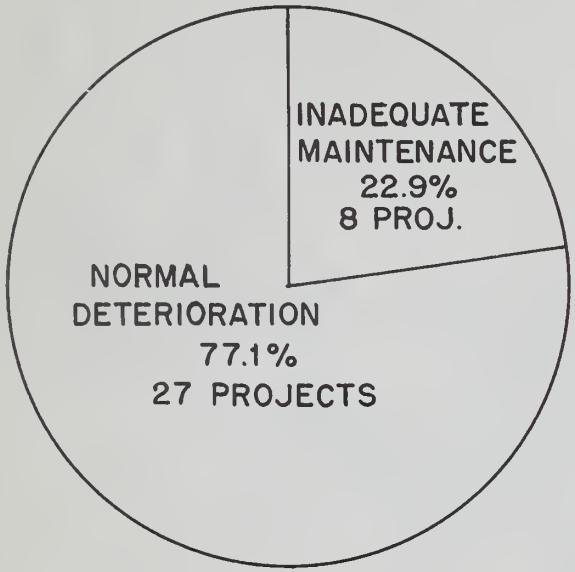
COMBINED-FAIR AND POOR CLASSES
49 PROJECTS



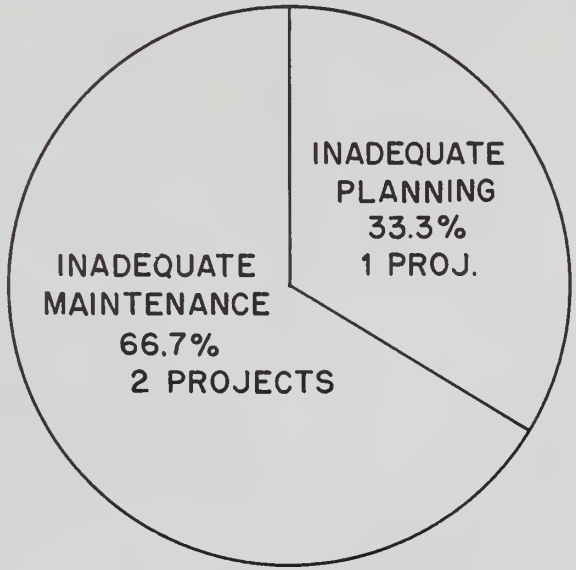
= CHART 14D =

REASONS FOR INFERIOR CONDITIONS OF SELECTED TYPES OF PROJECTS
- ACCESS ROADS -

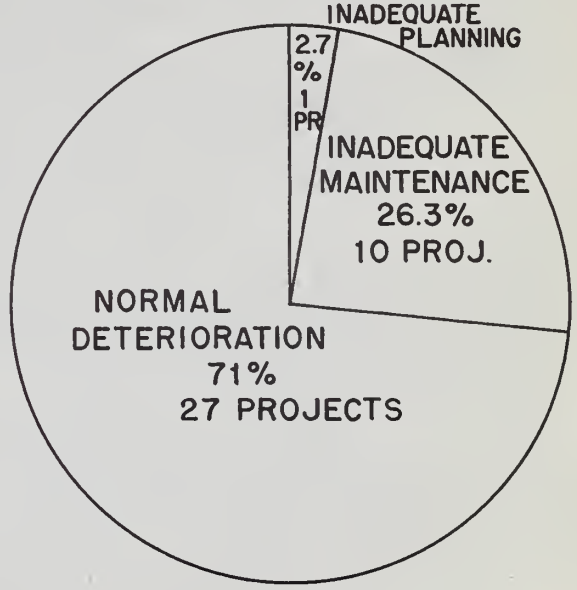
FAIR CONDITION CLASS
35 PROJECTS



POOR CONDITION CLASS
3 PROJECTS



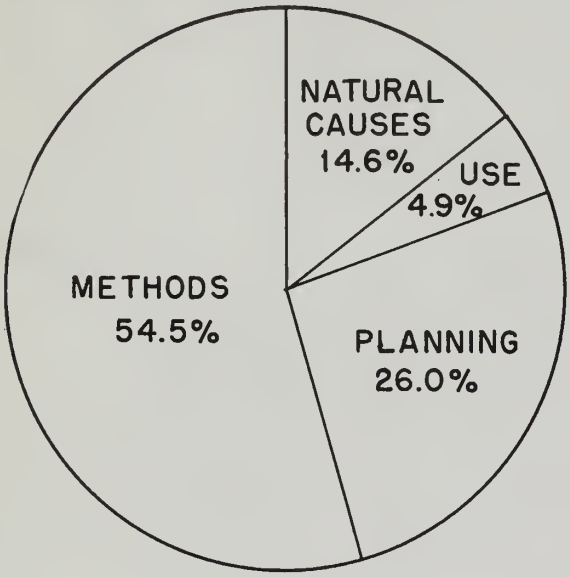
COMBINED-FAIR AND POOR CLASSES
38 PROJECTS



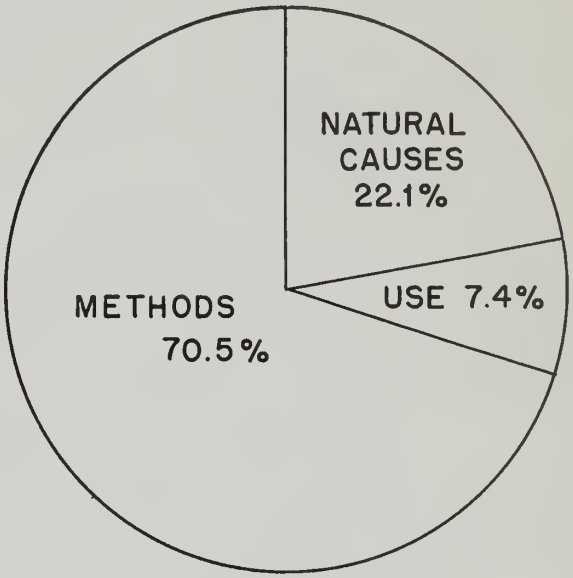
= CHART 15 =

CAUSES OF INFERIOR RESULTS IN SELECTED TYPES OF RESEEDING PROJECTS

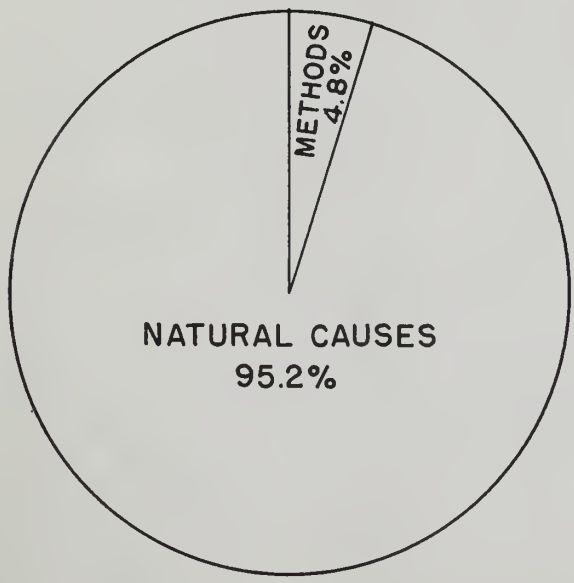
SEED BROADCAST ONLY
12,240 ACRES - POOR TO FAILURE



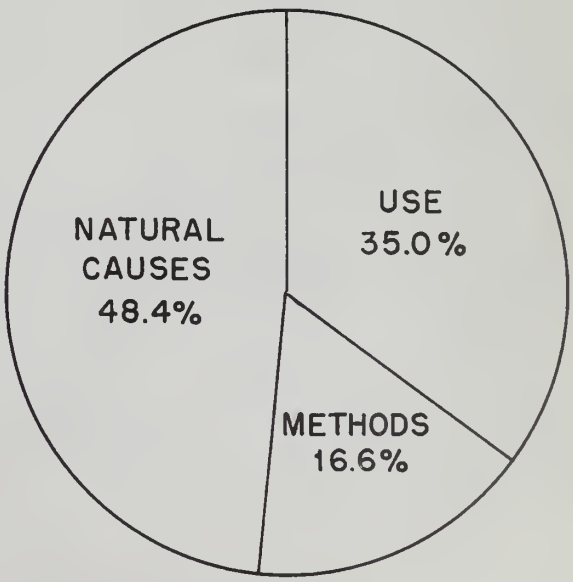
SEED BROADCAST - RAILED
8,143 ACRES - POOR TO FAILURE



SEED BROADCAST - DISC OR PLOWED
9,008 ACRES - POOR TO FAILURE



DRILLED - NO SOIL PREPARATION
6,006 ACRES - POOR TO FAILURE



seed was broadcast followed by a disc or plow operation, natural causes were the predominant factor in poor results. When seed was drilled with no soil preparation, natural cuases again were high (48.4%), while improper use caused 35% and inadequate method 16.6% of the poor results.

In summary, these causes of reseeding project failures indicate a need for more study and planning in preparation for reseeding projects generally, and better assurance of proper management before attempting such an operation. Notwithstanding the many details brought out in this analysis, the field report data do not supply sufficient basic information to permit outlining reseeding success standards any more closely than they are now generally understood. Most of the well planned reseeding work has been done in the last three years, and does not cover a long enough period to warrant estimates of probable success in terms of one year out of two, one year out of three, etc. Older projects were so loosely planned and observed, in most cases, as to warrant only the most general and obvious conclusions.

Failures in Effectiveness Mostly Avoidable

The physical condition of projects was not a criterion for all phases of success or failure. Many projects which were physically perfect failed to accomplish beneficial effects on resource values, whereas other projects that were poor physically made generous contributions to soils, vegetation, or management. The failures in effectiveness were due to three basic reasons: inadequate planning, inadequate construction or methods, and improper use.

In some cases stock water reservoirs were constructed in drainages which did not provide sufficient water to fill the structure. In such cases the structure was physically sound but failed to function due to poor planning. Some reseeding projects which produced good stands have been severely overgrazed as soon as they produced better forage than the adjacent lands. In this case the reseeding operation itself was definitely successful, but effective management planning was lacking and the project failed to be beneficial to the vegetation and soils on the reseeded area. Inadequate planning ranked relatively high among the causes of failures in effectiveness.

An example of inadequate structure or methods is the case of a water spreading system where the dikes were well planned to hold the water where it was needed but there was no soil compaction in the fills and many of them did not hold. Properly constructed this would have been a very successful and effective project, but due to poor construction failed to be effective, as well as being a physical failure. Some projects were ineffective because they

were poorly constructed or the wrong methods were used. For example, an area which contained good soils and received ample precipitation was broadcast to crested wheatgrass and although there was some replacement of inferior species the overall carrying capacity was not materially increased. However, in this case a good job of soil preparation and drilling would have produced a good stand and greatly increased the grazing value. These examples show that adequate methods and good construction are necessary components of an effective project.

Improper use ranked rather high in the reasons for failures in effectiveness. An outstanding example of improper use is the case where one area was well watered but was being overgrazed while adjacent to it was a practically unused area with no water developments. Reservoirs were constructed in the latter area, but instead of distributing the livestock between the two areas, all use was shifted from the formerly overgrazed area to the unused area and as a consequence it was soon as badly deteriorated as the first. More examples of this nature could be quoted, but it is hardly necessary to emphasize the necessity for judicious use of any improvement, if it is to produce the desired effects.

Most other cases of failures in effectiveness were caused by natural factors over which no control could be exercised. For example, some seeded species germinated well and produced good stands, but were later killed out or set back by drought; other seedings were washed out by cloudbursts. Other projects that could still be effective by developing them further. The majority of the causes of failure in this group cannot be controlled and should be regarded in the same light as any agricultural risk such as drought, hail, floods, and so forth.

Adverse Effects of Projects Hit Soils Hardest

A wide majority of all conservation projects examined were beneficial to resource values. There were some projects that had no effect and a very small percentage that were actually adverse to resource values (Chart 6a, 6b, 6c). By way of comparison 5% of all projects examined had an adverse effect on soils values, 3% adversely effected vegetation and only 1% were adverse to management. There was no practical means of determining the area affected by these adverse projects nor the degree to which they influenced each area. The individual field reports, however, indicated that generally the areas harmed were small areas immediately adjacent to the installation concerned. Therefore, it appears that the percentage figures listed above, which are based strictly on numbers of projects, may considerably magnify the relative importance of these adverse projects.

It is natural that soils and vegetation values should reflect the influence of adverse projects more than does management, because management is flexible and can be adjusted by one means or another to overcome adversities. In making these adjustments, however, management can and often does shift the load to soils and vegetation, which can only adjust themselves downward. For example, when forage becomes short livestock can be shifted to a better area, thus solving the management problem, but this brings no immediate relief to the soils and vegetation, which must wait for assistance from nature.

Most Adverse Effects Man-Caused

Examination of the reasons for adverse effects noted in this study indicates that there was one outstanding cause, namely, improper use (Chart 16). Faulty planning, poor methods or structures, and an aggregate group of other causes, mostly natural, accounted for the small remainder.

Improper use was the reason for 88.3% of all cases of adverse effects on resource values. Too early grazing of reseeded areas has not only destroyed otherwise successful projects, but often has left less ground cover than originally existed. New forage resources were made available by the development of stock water in some cases, but all the stock from adjacent overgrazed areas were then brought in, resulting in overgrazing of a new area. Fences built to promote seasonal use sometimes have been used with opposite effect. These effects emphasize the need for closer coordination between the management and S&M phases of the program.

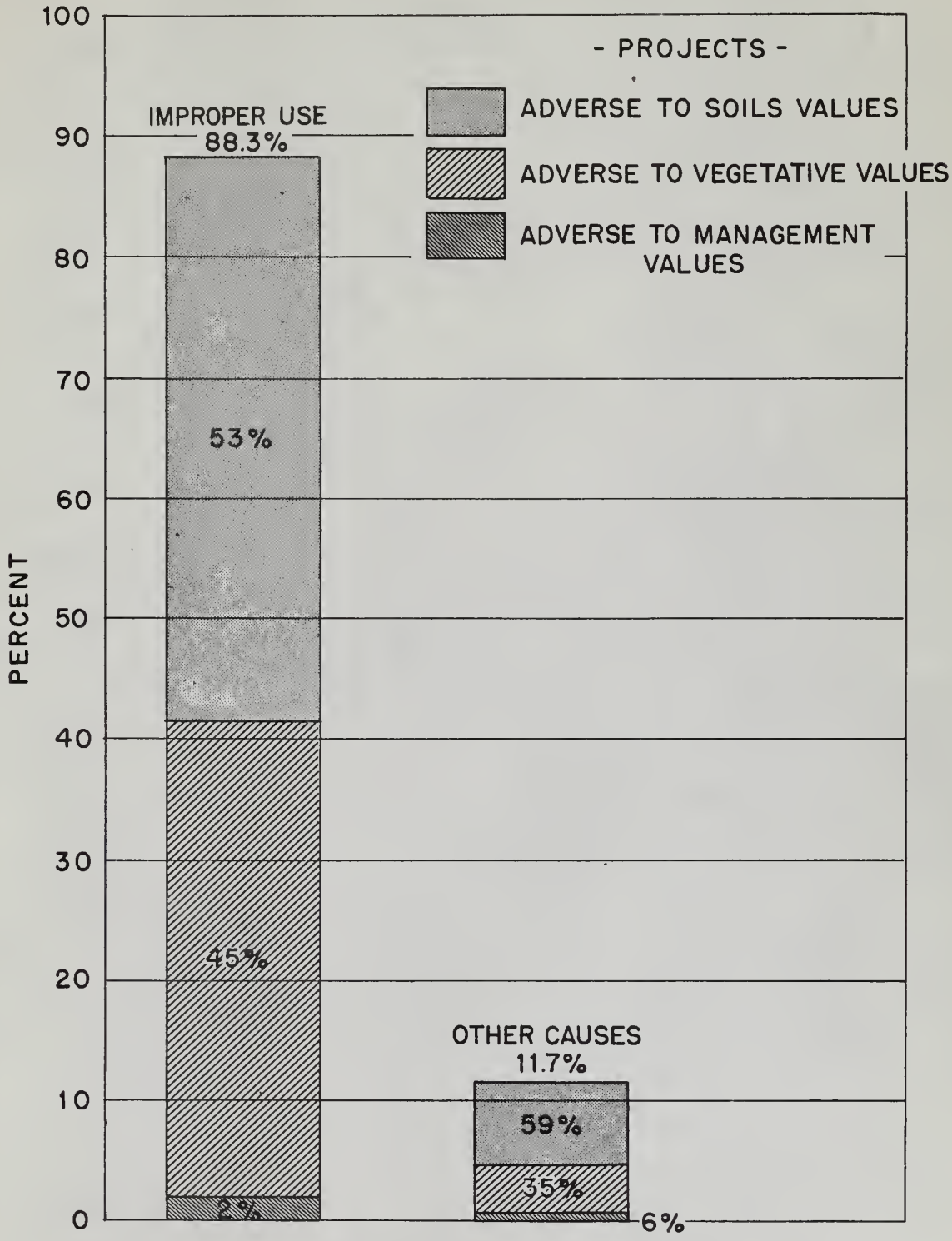
The part of poor planning in causing adverse effects from projects seems to come from a lack of sufficient knowledge in general. Some kinds of projects such as reseeding, water spreading, and contour furrowing, are not thoroughly understood, nor is the necessary information available. Consequently, many of the deficiencies in planning which caused adverse effects will be eliminated as information becomes available through research and through field trials.

Poor structure and methods surprisingly were practically negligible as causes of adverse effect. It must be recognized that much conservation project work is relatively new, that trial applications often must precede full knowledge, and that the development of practical machinery with which to construct and maintain many new projects is even further behind.

The causes of adverse effects which are grouped together under the heading of "Other" may be summed up under natural causes such as drought, floods, depredations by animals and insects, lack of maintenance, and unknown causes.

= CHART 16 =

CAUSES OF ADVERSE EFFECTS AS PERCENTAGE OF THE PROJECTS HAVING ADVERSE EFFECTS ON RESOURCE VALUES



Present Projects Mean Future Obligations

Project obligations do not cease with completion of the original structure or operation. Practically all types of projects constructed under the soil and moisture program need periodic maintenance. Some, sooner or later, will need complete reconstruction or repeating. Others will need to be developed further, and a few should be abandoned or salvaged for other uses (see Chart 17, 17a). As the numbers of projects increase the total expenses of maintenance also will increase.

Although the average rate of construction on existing S&M areas over the past thirteen years has been more than 230 projects annually, this rate has varied with the amount of funds available. The increasing interest displayed by the general public in conservation of natural resources suggests that more and more of this work will be done. If this prediction holds true the amount of maintenance will increase accordingly.

Most Projects Need Only Normal Maintenance

The majority of all maintenance falls under the heading of normal maintenance---that amount of upkeep and repair needed to offset the damages resulting from ordinary usage, age, and the elements of nature. Approximately one-third of all projects examined were reported as needing maintenance repair in some degree at this time. Assuming that maintenance programs were current at the time of inspection, this figure would suggest that one-third of all projects need maintenance annually or, on the average, each project would need repairs once in every three years.

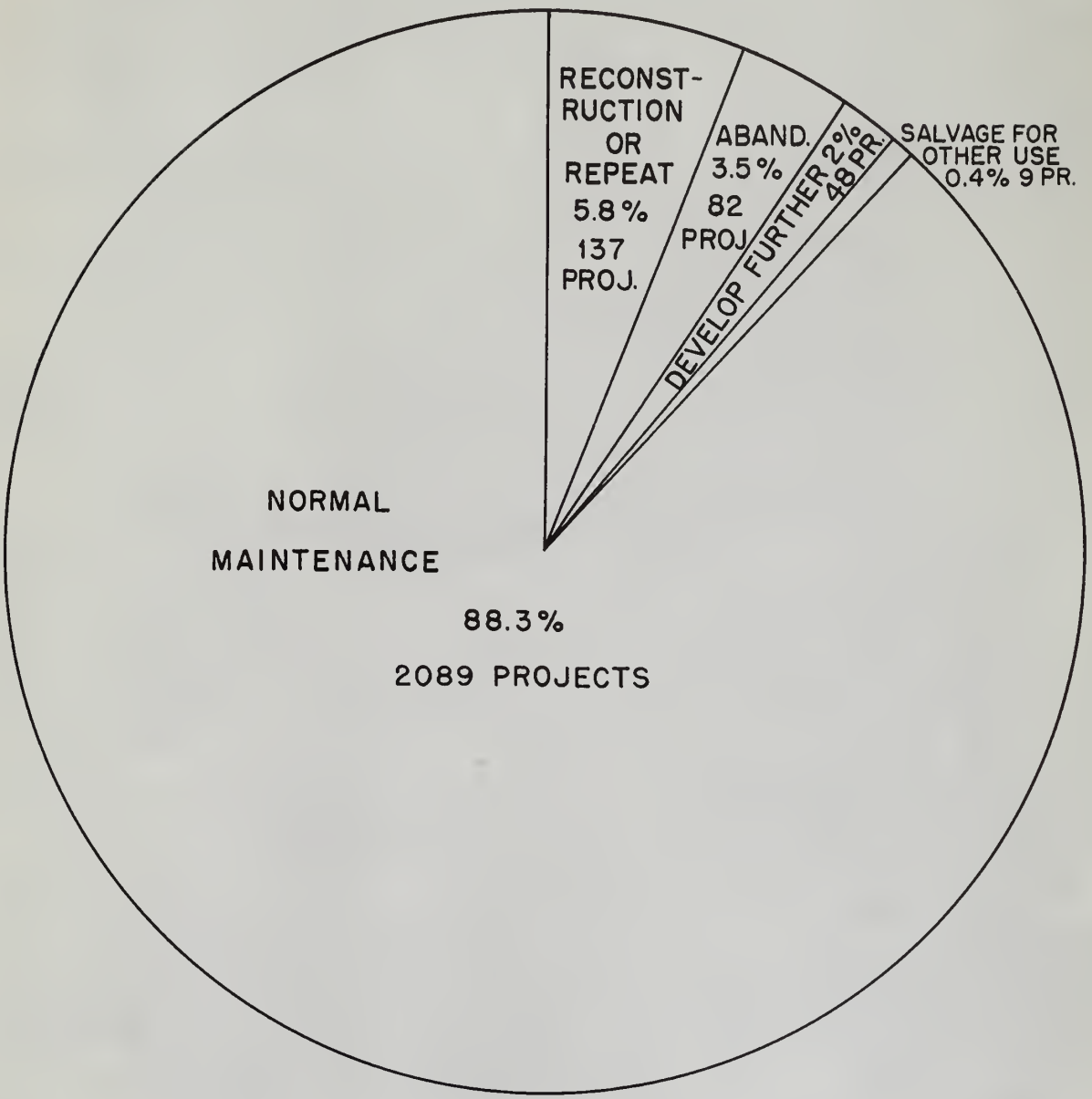
Maintenance Agreements Get Results, Add Interest

At the present time 36 per cent of all the projects reported are covered by maintenance agreements, under which stockmen, wildlife organizations or others have agreed to maintain the projects. It cannot be expected that such agreements can be obtained on all projects because many projects such as silt checks and detention dams do not contribute much to the range user on whose allotment they are constructed, but rather produce most of their effect on downstream structures and values.

Compared on the basis of equal numbers of projects in each category, projects under maintenance agreements showed only 3 maintenance failures for every 7 such failures among projects not covered by maintenance agreements (see Chart 18). These figures indicate that the ccoperators have done a far better job of maintenance than has the Bureau. Maintenance agreements are favored in this comparison

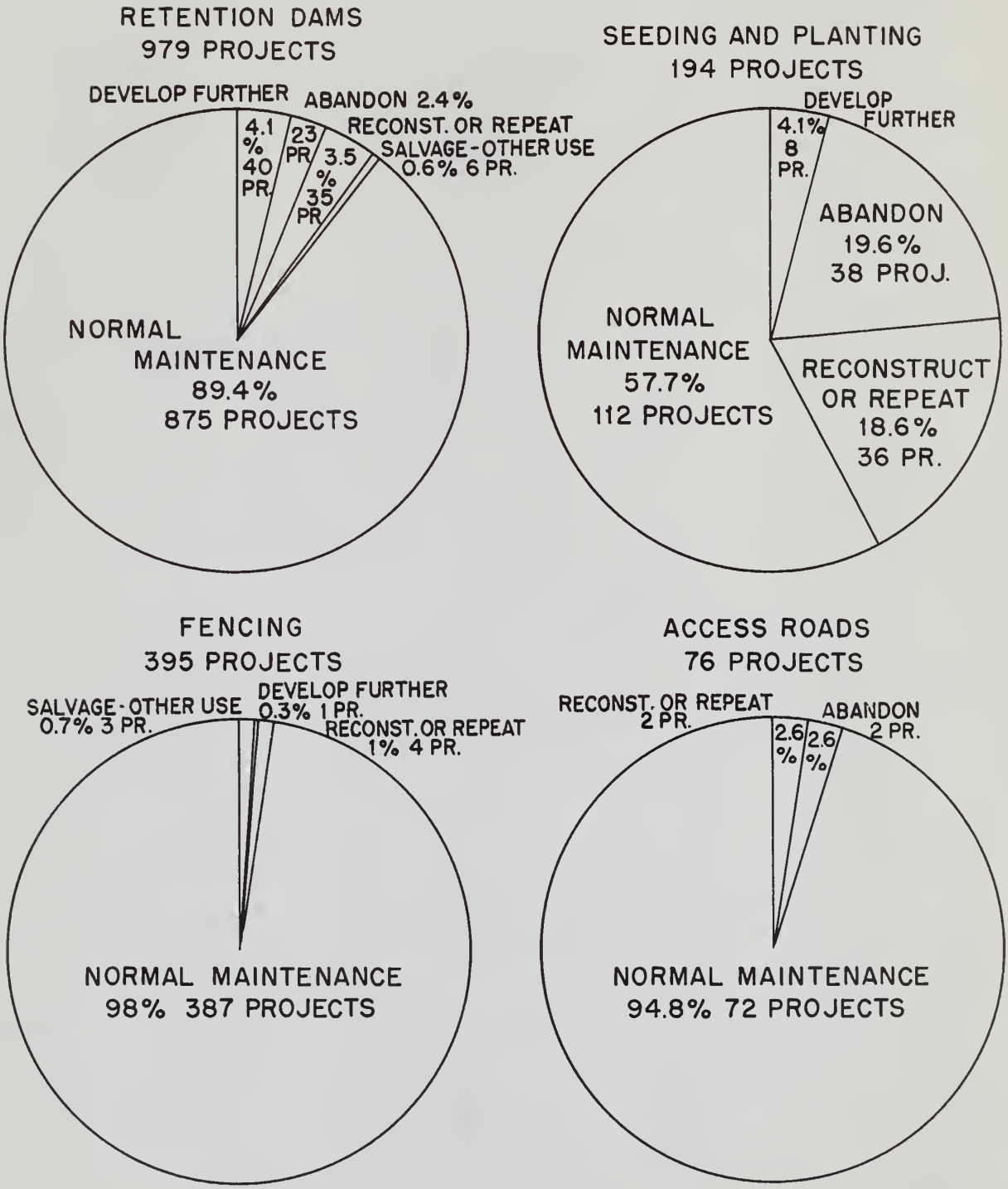
= CHART 17 =

RECOMMENDED FUTURE TREATMENT
(ALL S AND M PROJECTS EVALUATED)



= CHART 17A =

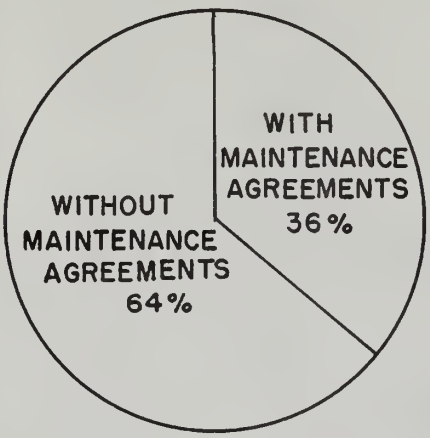
RECOMMENDED FUTURE TREATMENT OF SELECTED KINDS OF PROJECTS



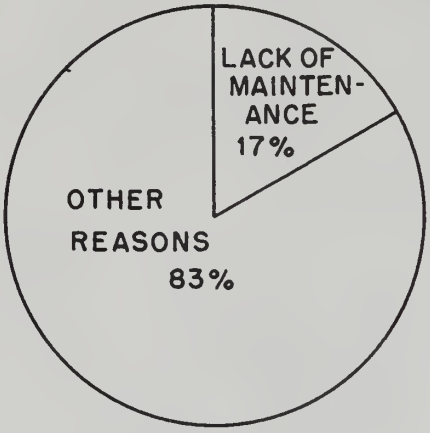
= CHART 18 =

PROJECT FAILURES AND MAINTENANCE AGREEMENTS

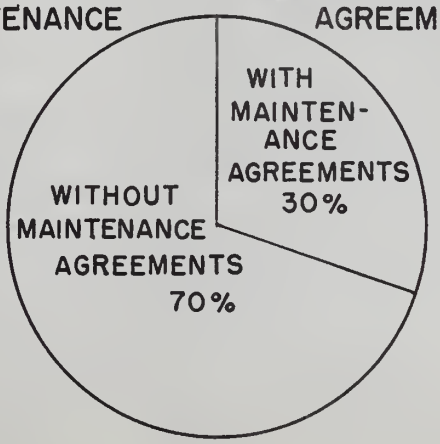
TOTAL PROJECTS



TOTAL FAILURES



RATIO BETWEEN NUMBERS OF FAILURES IN EQUAL NUMBERS OF PROJECTS WITH AND WITHOUT MAINTENANCE AGREEMENTS



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by the fact that, while relatively few of the older projects are covered by agreements, because of their age these are the projects now showing most of the failures. Data on age of projects were insufficient to permit segregation of this factor. Additional benefits, not emphasized by the charts and figures are derived from these cooperative agreements. Under them the cooperators not only have relieved the Bureau of some of the burden of responsibility, but also have relieved us of the cost, which is a considerable and ever increasing item. Furthermore, these cooperative agreements go far in strengthening the interest of range users in the welfare of the resource, since it gives them both a responsibility and a share in the conservation program.

A Few Projects Need Further Development

Of the projects examined, about two per cent were inadequate to accomplish the full results for which they were planned or of which they should have been capable. Some reservoirs did not hold water because of porous soil structure, but could be sealed with bentonite. Some springs left unprotected would give better service if fenced. This group composes a relatively small fraction of the total projects but does indicate one more problem that must be considered in future planning of the program.

Reconstruction or Repetition Sometimes is "Normal."

The largest group beside those requiring only normal maintenance was composed of projects requiring reconstruction, or repetition in the case of certain vegetative control and protection projects. It does not seem probable that we will ever be able to control or even accurately predict the vagaries of nature, and therefore, will never perfect conservation work to the point where there will be no failures. As we reduce the number of failures in one kind of project through increased knowledge other kinds will be introduced with new problems to solve. It is, therefore, questionable whether we will be able to reduce materially the percentage of projects that will have to be repeated or reconstructed before complete success is achieved. Of all the projects examined, 5.8 per cent were noted on the field reports as needing to be redone. It seems probable that a similar fraction of work may be expected as long as we continue with progressive efforts to conserve natural resources.

There's Gold Left in the Ills

Nine projects no longer useful for their original purposes were noted as having salvage value. These included fences that were no longer needed and retention dams which no longer furnished stock water, but which could continue to serve as silt check dams. Mention of this minor group is made merely to point out the possibilities of salvaging many old projects rather than abandoning them.

Value to be Had Even from Abandoned Projects

Abandonment was recommended by the examiners on a number of projects constituting 3.5 per cent of the total reported. Primarily these projects were ones that had served out their normal life span and had no salvage value. Some were projects which had failed for some reason or cause which could not be remedied. Each year a certain number of projects will reach the point where they are no longer valuable for their intended purposes and should be abandoned, but these projects will have some value in providing the information necessary in calculating service-life expectancies and total values.

B. SOME IMPORTANT FACTORS NOT ANALYSED

Several factors of well recognized importance relating to the effectiveness and advisability of the S&M program as a whole, and to various particular phases of it, have not been analysed in this report. In all cases lack of information prevented such analysis.

Among these factors, three bearing upon the reliability of the measurement of project effectiveness here used should be noted. These are (1) area of benefit, (2) degree of benefit, and (3) total benefit from each particular project. The project forms did not provide for securing this information. Desirable as such information would be, it could not be secured with present numbers of personnel.

Closely related to the foregoing are cost and benefit relationships. Existing project cost records were included in the reports on some project areas, but not on enough areas to permit systematic analysis.

Lack of cost records likewise prevented adequate appraisal of inter-fund relationships in total program accomplishments. The usefulness of such information, if available, is emphasized by the current policy of requiring substantial cooperative funds for use along with S&M funds in project construction, and of requiring that major maintenance costs be borne by other than S&M funds. Project segregations into S&M and non-S&M appearing in the project area write-ups are misleading, since all projects on which any S&M funds were applied were arbitrarily classified as S&M projects. The degree of disparity existing here is illustrated by analysis of 13 project areas in Region I on which cost records were submitted. Total projects in these areas were classified as 55% S&M and 45% non-S&M, whereas total funds recorded were 35% S&M and 65% non-S&M. The disparity would have been even greater had value of CCC labor been shown.

Again, lack of cost records, together with lack of coverage on projects done under Section 4 permits, prevented analysis of the contributions made by range users to the overall conservation program.

Table 1--Acreage of Federal Range Under Severe to Critical Erosion, and Under S&M Treatment, in Grazing Districts, January 1, 1949, by Regions

Region	Acres in Grazing Districts	Severe to Critical Erosion, Acres in Grazing Districts*	Percent of Grazing District Area Under Severe to Critical Erosion	Acres S&M Conservation Areas Within Grazing Districts	Percent of Federal Range in Grazing Districts Included Within S&M Conservation Areas
I	24,419,720	12,493,067	51.2	5,598,390	22.9
II	36,571,896	21,690,614	59.3	7,750,924	21.1
III	18,738,217	10,990,691	58.7	5,579,793	29.8
IV	31,137,755	17,992,096	57.8	6,262,737	20.1
V	24,030.782	13,544,368	56.4	6,166,519	25.6
Total all Regions	134,898,370	76,710,836	56.9	31,358,363	23.2

* Based upon 1936 survey of erosion conditions by the Soil Conservation Service, and others.

Table 1 A--Acreage of Federal Range Under Severe to Critical Erosion and Under S&M Treatment in Grazing Districts, January 1, 1949, by States

State	Acres in Grazing Districts	Severe to Critical Erosion, Acres in Grazing Districts*	Percent of Grazing District Area Under Severe to Critical Erosion	Acres S&M Conservation Areas Within Grazing Districts	Percent of Federal Range in Grazing Districts Included Within S&M Conservation Areas
Arizona	9,763,947	5,386,498	55.2	2,525,484	25.9
California	2,903,497	1,571,740	54.1	1,047,993	36.0
Colorado	7,489,310	4,147,447	55.4	2,074,256	27.7
Idaho	12,122,192	5,882,967	48.5	3,131,449	25.8
Montana	5,234,391	2,192,480	41.9	1,286,359	24.5
Nevada	33,668,399	20,118,874	59.8	6,702,931	19.9
New Mexico	14,266,835	8,157,870	57.2	3,641,035	25.5
Oregon	12,297,528	6,610,100	53.8	2,466,941	20.0
Utah	23,648,445	13,844,649	58.5	4,188,481	17.7
Wyoming	13,503,826	8,798,211	65.2	4,293,434	31.7
Totals	134,898,370	76,710,836	56.9	31,358,363	23.2

* Based upon 1936 survey of erosion conditions by the Soil Conservation Service, and others.

Table II. Completed Projects Reported in S&M Projects Areas, Within Grazing Districts, by Regions.

Kind of Project	Units	Region I		Region II		Region III		Region IV		Region V		All Regions	
		Projects	Units	Projects	Units	Projects	Units	Projects	Units	Projects	Units	Projects	Units
Vegetative Control & Protection Group													
1. Brush & Weed Control	Acres	1	1,350	6	42,500	1	2,668	-	-	1	50	9	46,568
2. Pest Control	"	3	32,640	-	-	5	25,024	6	57,135	1	30,000	15	144,799
3. Seeding & Planting	"	51	66,881	38	27,133	41	46,063	80	97,422	16	10,265	226	247,764
4. Tree Planting	Number	-	-	-	-	2	9,000	-	-	1	5,000	3	14,000
5. Fire Protection	Number	5	5	-	-	-	-	-	-	-	-	5	5
6. Fencing	Miles	126	354.62	48	153.00	32	328.95	37	223.79	167	727.75	410	1,788.11
7. Check Plots	Number	-	-	2	3	3	7	-	-	-	-	5	10
Water Control Group													
1. Canals & Ditches	Miles	3	2.24	-	-	1	.50	5	15.15	3	.75	12	18.64
2. Contouring	Acres	1	360	-	-	3	7,510	-	-	-	-	4	7,870
3. Diking	"	-	-	-	-	-	-	-	-	2	120	2	120
4. Water Spreading	"	1	40	-	-	6	4,305	1	600	3	1,744	11	6,689
5. Checks	Number	4	30	-	-	-	-	14	106	-	-	18	136
6. Dams - Detention	"	-	-	-	-	-	-	1	11	-	-	1	11
7. Dams - Diversion	"	-	-	-	-	2	2	1	1	32(1)	32	35	35
8. Dams - Retention	"	315	315	84	84	604	604	231	231	86	86	1,320	1,320
9. Streambank Protection	Miles	1	1.00	-	-	-	-	1	1.50	-	-	2	2.50
10. Springs	Number	142	142	50	50	51	51	110	110	18	18	371	371
11. Wells	"	7	7	58	58	51	51	17	17	55	55	188	188
12. Pipelines	Linear Feet	4	24,028	6	29,126	-	-	-	-	1	7,190	11	60,344
13. Storage Tanks	Number	-	-	-	-	-	-	-	-	2	2	2	2
Range Use Facilitating Group													
1. Bridges	Number	3	3	-	-	18	18	-	-	-	-	21	21
2. Corrals	"	15	15	14	14	19	19	1	1	5	5	54	54
3. Cattle Guards	"	66	74	22	22	16	16	19	19	31	31	154	162
4. Pack & Stock Trails	Miles	1	2.00	11	84.20	1	6.00	7	9.45	3	3.50	23	105.15
5. Truck Trails (Access Roads)	"	42	267.98	18	151.75	37(1)	631.20	19	186.07	20(1)	123.80	136	1,360.80
Totals		791(2)		357(2)		893(2)		550(3)		447(4)		3,038	

(1) Estimated.
(2) Considered to include all existing projects directly significant to conservation.
(3) Estimated as 60% coverage of all existing projects, of which an estimated 90% are directly significant to conservation.
(4) " " 80% " " " " " " " " " " " " " " " " " "

Table II A. Completed Projects Reported to S&M Project Areas Within Grazing Districts, by States.

Kind of Project	Unit	Arizona		California		Colorado		Idaho		Montana		Nevada		New Mexico		Oregon		Utah		Wyoming		Total All States	
		Projects	Units	Projects	Units	Projects	Units	Projects	Units	Projects	Units	Projects	Units	Projects	Units	Projects	Units	Projects	Units	Projects	Units	Projects	Units
Vegetative Control & Protection Group																							
1. Brush & Weed Control	Acres	1	50	-	-	-	-	1	1,350	-	-	6	42,500	-	-	-	-	-	-	1	2,668	9	46,568
2. Pest Control	"	1	30,000	-	-	5	53,135	2	20,000	5	25,024	-	-	-	-	1	12,640	1	4,000	-	-	15	144,799
3. Seeding & Planting	"	12	8,755	2	2,540	51	41,434	35	45,359	2	766	36	24,593	4	1,510	16	21,522	29	55,988	39	45,297	226	247,764
4. Tree Planting	Number	-	-	-	-	-	-	-	-	-	-	-	-	1	5,000	-	-	-	-	2	9,000	3	14,000
5. Fire Protection	"	-	-	-	-	-	-	5	5	-	-	-	-	-	-	-	-	-	-	-	-	5	5
6. Fencing	Miles	89	388.67	4	12.50	15	93.32	51	124.88	16	43.70	44	140.50	78	339.08	75	229.74	22	130.47	16	285.25	410	1,788.11
7. Check Plots	Number	-	-	-	-	-	-	-	-	1	1	2	3	-	-	-	-	-	-	2	6	5	10
Water Control Group																							
1. Canals & Ditches	Miles	-	-	-	-	2	.75	-	-	-	-	-	-	3	.75	3	2.24	3	14.40	1	.50	12	18.64
2. Contouring	Acres	-	-	-	-	-	-	1	360	2	6,950	-	-	-	-	-	-	-	-	1	560	4	7,870
3. Diking	"	1	20	-	-	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	2	120
4. Water Spreading	"	-	-	-	-	1	600	1	40	6	4,305	-	-	3	1,744	-	-	-	-	-	-	11	6,689
5. Checks	"	-	-	-	-	13	105	4	30	-	-	-	-	-	-	-	-	1	1	-	-	18	136
6. Dams - Detention	Number	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	11	-	-	1	11
7. Dams - Diversion	"	12	12	-	-	1	1	-	-	1	1	-	-	20	20	-	-	-	-	1	1	35	35
8. Dams - Retention	"	17	17	38	38	142	142	117	117	188	188	46	46	69	69	198	198	89	89	416	416	1,320	1,320
9. Streambank Protection	Miles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.00	1	1.50	-	-	2	2.50
10. Springs	Number	13	13	5	5	89	89	95	95	19	19	45	45	5	5	47	47	21	21	32	32	371	371
11. Wells	"	14	14	8	8	7	7	3	3	9	9	50	50	41	41	4	4	10	10	42	42	188	188
12. Pipelines	Lin. Ft.	-	-	-	-	-	-	3	22,440	-	-	6	29,126	1	7,190	1	1,588	-	-	-	-	11	60,344
13. Storage Tanks	Number	1	1	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	2	2
Range Use Facilitating Group																							
1. Bridges	Number	-	-	-	-	-	-	3	3	-	-	-	-	-	-	-	-	-	-	18	18	21	21
2. Corrals	"	5	5	-	-	-	-	10	10	7	7	14	14	-	-	5	5	1	1	12	12	54	54
3. Cattle Guards	"	11	11	2	2	2	2	22	24	-	-	20	20	20	20	44	50	17	17	16	16	154	162
4. Pack & Stock Trails	Miles	1	2.00	-	-	4	7.70	1	2.00	-	-	11	84.20	2	1.50	-	-	3	1.75	1	6.00	23	105.15
5. Truck Trails (Access Roads)	"	16*	79.30	2	12.50	12	37.07	22	111.98	2	13.00	16	139.25	4	44.50	20	156.00	7	149.00	35*	618.20	136	1,360.80
Totals		194		61		344		376		258		296		253		415		206		635		3,038	

* Estimated.

Table III. Physical Condition of Projects Completed in S&M Project Areas Within Grazing Districts, by Regions

Kind of Project	Summary All Projects Evaluated				Analysis of Projects into Three Condition Classes																			
					REGION I				REGION II				REGION III				REGION IV				REGION V			
	Condition				Condition				Condition				Condition				Condition				Condition			
	All	Good	Fair	Poor	All	Good	Fair	Poor	All	Good	Fair	Poor	All	Good	Fair	Poor	All	Good	Fair	Poor	All	Good	Fair	Poor
Vegetative Control & Protection Group																								
1. Brush & Weed Control	9	6	2	1	1	1	-	-	6	3	2	1	1	1	-	-	-	-	-	-	1	1	-	-
2. Pest Control	9	5	4	-	3	3	-	-	-	-	-	-	5	2	3	-	1	-	1	-	-	-	-	-
3. Seeding & Planting	193	68	36	89	44	20	3	21	34	10	4	20	30	4	8	18	69	33	18	18	16	1	3	12
4. Tree Planting	3	1	1	1	-	-	-	-	-	-	-	-	2	1	1	-	-	-	-	-	1	-	-	1
5. Fire Protection	5	2	1	2	5	2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	395	342	49	4	126	94	28	4	48	48	-	-	32	23	9	-	22	21	1	-	167	156	11	-
7. Check Plots	5	4	-	1	-	-	-	-	2	1	-	1	3	3	-	-	-	-	-	-	-	-	-	-
Water Control Group																								
1. Canals & Ditches	7	5	2	-	3	2	1	-	-	-	-	-	1	1	-	-	-	-	-	-	3	2	1	-
2. Contouring	3	2	-	1	1	-	-	1	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-
3. Diking	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-
4. Water Spreading	10	7	3	-	1	1	-	-	-	-	-	-	6	4	2	-	-	-	-	-	3	2	1	-
5. Checks	5	3	-	2	4	2	-	2	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	3	3	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	1	1	-	-
8. Dams - Retention	956	782	79	95	250	208	21	21	78	59	11	8	406	360	16	30	149	86	28	35	73	69	3	1
9. Streambank Protection	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-
10. Springs	324	201	71	52	136	84	21	31	49	26	17	6	37	15	19	3	89	68	11	10	13	8	3	2
11. Wells	144	118	11	15	7	4	1	2	58	45	9	4	20	16	-	4	13	11	-	2	46	42	1	3
12. Pipelines	12	7	2	3	4	4	-	-	6	2	1	3	-	-	-	-	-	-	-	-	2	1	1	-
13. Storage Tanks	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-
Range Use Facilitating Group																								
1. Bridges	3	3	-	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	44	31	11	2	15	12	2	1	15	11	4	-	9	3	5	1	-	-	-	-	5	5	-	-
3. Cattle Guards	123	87	27	9	74	45	20	9	20	13	7	-	-	-	-	-	1	1	-	-	28	28	-	-
4. Pack & Stock Trails	20	14	3	3	3	2	-	1	11	9	-	2	-	-	-	-	3	3	-	-	3	-	3	-
5. Truck Trails (Access Roads)	96	53	38	5	42	24	16	2	16	10	4	2	25	10	14	1	7	7	-	-	6	2	4	-
Totals	2,372	1,747	340	285	722	511	114	97	343	237	59	47	581	447	77	57	356	232	59	65	370	320	31	19

Table III A. Physical Condition of Projects Completed in S&M Project Areas Within Grazing Districts, by States
Total Projects Evaluated

Analysis of Projects into Three Condition Classes

Kind of Project	ARIZONA			CALIFORNIA			COLORADO			IDAHO			MONTANA			NEVADA			NEW MEXICO			OREGON			UTAH			WYOMING		
	Condition			Condition			Condition			Condition			Condition			Condition			Condition			Condition			Condition			Condition		
	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor
Vegetative Control & Protection Group																														
1. Brush & Weed Control	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	3	2	1	-	-	-	-	-	-	-	-	-	1	-	-
2. Pest Control	-	-	-	-	-	-	-	-	-	-	-	-	2	3	-	-	-	-	-	-	-	3	-	-	-	1	-	-	-	-
3. Seeding & Planting	1	2	9	-	1	1	17	14	16	13	3	13	1	-	1	10	3	19	-	1	3	7	-	8	16	4	2	3	8	17
4. Tree Planting	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1	-
5. Fire Protection	-	-	-	-	-	-	-	-	-	2	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	84	5	-	4	-	-	-	-	-	36	15	-	9	7	-	44	-	-	72	6	-	58	13	4	21	1	-	14	2	-
7. Check Plots	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	2	-	-
Water Control Group																														
1. Canals & Ditches	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	2	1	-	-	-	-	1	-	-
2. Contouring	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	-	-	-	-	-	-	-	-	-	1	-	-	4	2	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-
5. Checks	-	-	-	-	-	-	-	-	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2	-	-
8. Dams - Retention	10	2	-	30	2	-	27	28	35	98	3	10	157	9	18	29	9	8	59	1	1	110	18	11	59	-	-	203	7	12
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
10. Springs	5	2	2	4	-	-	49	9	10	70	13	6	10	7	3	22	17	6	3	1	-	14	8	25	19	2	-	5	12	-
11. Wells	8	1	1	3	4	1	4	-	-	2	-	1	5	-	2	42	5	3	34	-	2	2	1	1	7	-	2	11	-	2
12. Pipelines	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	3	1	1	-	4	-	-	-	-	-	-	-	-
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group																														
1. Bridges	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	5	-	-	3	-	-	-	-	-	8	1	1	-	5	-	8	4	-	-	-	-	4	1	-	-	-	-	3	-	1
3. Cattle Guards	10	-	-	1	-	-	-	-	-	14	5	5	-	-	-	12	7	-	18	-	-	31	15	4	1	-	-	-	-	-
4. Pack & Stock Trails	-	1	-	-	-	-	-	-	-	2	-	1	-	-	-	9	-	2	-	2	-	-	-	-	3	-	-	-	-	-
5. Truck Trails (Access Roads)	1	1	-	-	-	-	-	-	-	8	13	1	8	11	1	10	4	2	1	3	-	16	3	1	7	-	-	2	3	-
Totals	125	14	12	45	7	2	97	51	61	260	54	43	199	44	25	192	52	45	195	17	7	251	60	54	135	8	4	248	33	32

Table IV. Effects of Projects Completed in SAM Project Areas Within Grazing Districts on Soils, Vegetation, and Management Values, by Regions.

Kind of Project	SUMMARY ALL PROJECTS										REGION I										REGION II									
	Total Project Evaluated	Soils Value			Vegetation Value			Management Value			Total Project Evaluated	Soils Value			Vegetation Value			Management Value			Total Project Evaluated	Soils Value			Vegetation Value			Management Value		
		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse
Vegetative Control & Protection Group																														
1. Brush & Weed Control	9	4	4	1	7	2	-	8	1	-	1	1	-	-	1	-	-	1	-	-	6	2	3	1	4	2	-	5	1	-
2. Pest Control	9	9	-	-	9	-	-	9	-	-	4	4	-	-	4	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	191	91	90	7	100	88	3	79	110	2	42	23	19	-	23	19	-	23	19	-	34	8	23	3	12	21	1	5	29	-
4. Tree Planting	3	2	1	-	1	2	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Fire Protection	5	5	-	-	5	-	-	5	-	-	5	5	-	-	5	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	395	328	59	8	347	41	7	388	7	-	126	102	18	6	102	18	6	122	4	-	48	38	8	2	39	8	1	48	-	-
7. Check Plots	11	9	1	1	9	1	1	1	10	-	-	-	-	-	-	-	-	-	-	-	2	-	1	1	-	1	1	1	1	-
Water Control Group																														
1. Canals & Ditches	7	6	1	-	7	-	-	7	-	-	3	2	1	-	3	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-
2. Contouring	3	3	-	-	3	-	-	3	-	-	1	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	1	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	8	8	-	-	7	1	-	7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Checks	15	13	2	-	11	4	-	12	3	-	4	2	2	-	-	4	-	1	3	-	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	997	772	205	20	774	200	23	861	145	1	250	196	37	17	201	29	20	232	18	-	76	9	66	1	28	47	1	47	29	-
9. Streambank Protection	1	1	-	-	-	1	-	-	1	-	1	1	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
10. Springs	323	163	113	47	231	49	43	209	32	2	176	88	10	38	88	10	38	129	7	-	49	10	32	7	24	21	4	38	10	1
11. Wells	132	69	42	21	91	29	12	126	13	3	4	3	1	-	3	1	-	3	1	-	53	11	25	17	29	15	9	51	2	-
12. Pipelines	12	7	5	-	8	4	-	9	3	-	4	4	-	-	4	-	-	4	-	-	6	2	4	-	3	3	-	3	3	-
13. Storage Tanks	1	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group																														
1. Bridges	3	2	-	1	2	-	1	3	-	-	3	2	-	1	2	-	1	3	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	44	13	30	1	13	30	1	43	1	-	15	-	14	1	-	14	1	14	1	-	14	-	14	-	-	14	-	14	-	-
3. Cattle Guards	122	9	113	-	33	88	1	112	10	-	74	1	73	-	23	50	1	64	10	-	20	-	20	-	-	20	-	20	-	-
4. Pack & Stock Trails	18	5	8	5	10	5	3	16	2	-	1	-	1	-	-	1	-	1	-	-	11	-	6	5	4	4	3	9	2	-
5. Truck Trails (Access Roads)	77	41	31	5	41	36	-	75	2	-	42	26	15	1	26	16	-	42	-	-	16	-	12	4	-	16	-	14	2	-
Totals	2,387	1,565	705	117	1,711	581	95	2,035	344	8	716	461	191	64	486	163	67	652	64	-	335	80	214	41	143	172	20	295	79	1

Kind of Project	REGION III										REGION IV										REGION V									
	Total Project Evaluated	Soils Value			Vegetation Value			Management Value			Total Project Evaluated	Soils Value			Vegetation Value			Management Value			Total Project Evaluated	Soils Value			Vegetation Value			Management Value		
		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse
Vegetative Control & Protection Group																														
1. Brush & Weed Control	1	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	1	-	-	1	-	-
2. Pest Control	5	5	-	-	5	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	30	16	14	-	16	14	-	3	27	-	69	45	22	2	46	21	2	46	21	2	16	2	12	2	3	13	-	2	14	-
4. Tree Planting	2	2	-	-	1	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	1	-	-	1	-
5. Fire Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	32	31	1	-	31	1	-	31	1	-	22	20	2	-	21	1	-	20	2	-	167	137	30	-	154	13	-	167	-	-
7. Check Plots	9	9	-	-	9	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Control Group																														
1. Canals & Ditches	1	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3	3	-	-	3	-	-	3	-	-
2. Contouring	2	2	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	-	-	1	-	-
4. Water Spreading	6	6	-	-	6	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	1	1	-	1	1	-
5. Checks	-	-	-	-	-	-	-	-	-	-	11	11	-	-	11	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	449	421	27	1	395	53	1	400	48	1	149	89	60	-	85	63	1	102	47	-	73	57	15	1	65	8	-	70	3	-
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Springs	36	35	1	-	35	1	-	35	1	-	89	20	67	2	73	15	1	76	12	1	13	10	3	-	11	2	-	11	2	-
11. Wells	16	9	7	-	9	7	-	9	7	-	13	7	3	3	9	1	3	10	-	3	46	39	6	1	41	5	-	43	3	-
12. Pipelines	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	1	-	1	1	-	2	-	-
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	-	-	1	-	-
Range Use Facilitating Group																														
1. Bridges	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	9	9	-	-	9	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	6	4	2	-	4	2	-	6	-	-
3. Cattle Guards	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	8	20	-	10	18	-	28	-	-
4. Pack & Stock Trails	-	-	-	-	-	-	-	-	-	-	3	3	-	-	3	-	-	3	-	-	3	2	1	-	3	-	-	3	-	-
5. Truck Trails (Access Roads)	5	5	-	-	5	-	-	5	-	-	8	8	-	-	8	-	-	8	-	-	6	2	4	-	2	4	-	6	-	-
Totals	603	552	50	1	525	77	1	507	95	1	364	203	154	7	256	101	7	276	82	6	369	269	96	4	301	68	-	345	24	-

Table IV A. Effects of Projects Completed in S&M Project Areas Within Grazing Districts on Soils, Vegetation, and Management Values, Region I.

Kind of Project	IDAHO										OREGON									
	Total Project Evaluated	Soils Value			Vegetation Value			Management Value			Total Project Evaluated	Soils Value			Vegetation Value			Management Value		
		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse
Vegetative Control & Protection Group																				
1. Brush & Weed Control	1	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
2. Pest Control	2	2	-	-	2	-	-	2	-	-	2	2	-	-	2	-	-	2	-	-
3. Seeding & Planting	29	18	11	-	18	11	-	18	11	-	13	5	8	-	5	8	-	5	8	-
4. Tree Planting	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Fire Protection	5	5	-	-	5	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	51	39	11	1	39	11	1	47	4	-	75	63	7	5	63	7	5	75	-	-
7. Check Plots	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Control Group																				
1. Canals & Ditches	-	-	-	-	-	-	-	-	-	-	3	2	1	-	3	-	-	3	-	-
2. Contouring	1	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Checks	4	2	2	-	-	4	-	1	3	-	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	111	80	27	4	85	22	4	99	12	-	139	116	10	13	116	7	16	133	6	-
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1	-	-	1	-
10. Springs	89	71	4	14	71	4	14	86	3	-	47	17	6	24	17	6	24	43	4	-
11. Wells	-	-	-	-	-	-	-	-	-	-	4	3	1	-	3	1	-	3	1	-
12. Pipelines	4	4	-	-	4	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group																				
1. Bridges	3	2	-	1	2	-	1	3	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	10	-	10	-	-	10	-	10	-	-	5	-	4	1	-	4	1	4	1	-
3. Cattle Guards	24	1	23	-	23	-	1	23	1	-	50	-	50	-	-	50	-	41	9	-
4. Pack & Stock Trails	1	-	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
5. Truck Trails (Access Roads)	22	19	3	-	19	3	-	22	-	-	20	7	12	1	7	13	-	20	-	-
Totals	357	245	92	20	270	66	21	323	34	-	359	216	99	44	216	97	46	329	30	-

Table IV B. Effects of Projects Completed in S&M Project Areas Within Grazing Districts on Soils, Vegetation, and Management Values, Region II.

Kind of Project	CALIFORNIA										NEVADA									
	Total Project Evaluated	Soils Value			Vegetation Value			Management Value			Total Project Evaluated	Soils Value			Vegetation Value			Management Value		
		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse
Vegetative Control & Protection Group																				
1. Brush & Weed Control	-	-	-	-	-	-	-	-	-	-	6	2	3	1	4	2	-	5	1	-
2. Pest Control	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	2	-	2	-	-	2	-	-	2	-	32	8	21	3	12	19	1	5	27	-
4. Tree Planting	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Fire Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	4	4	-	-	4	-	-	4	-	-	44	34	8	2	35	8	1	44	-	-
7. Check Plots	-	-	-	-	-	-	-	-	-	-	2	-	1	1	-	1	1	1	1	-
Water Control Group																				
1. Canals & Ditches	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Contouring	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Checks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	32	-	32	-	-	32	-	15	17	-	44	9	34	1	28	15	1	32	12	-
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Springs	4	-	4	-	-	4	-	4	-	-	45	10	28	7	24	17	4	34	10	1
11. Wells	8	-	8	-	-	8	-	7	1	-	45	11	17	17	29	7	9	44	1	-
12. Pipelines	-	-	-	-	-	-	-	-	-	-	6	2	4	-	3	3	-	3	3	-
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group																				
1. Bridges	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	-	-	-	-	-	-	-	-	-	-	14	-	14	-	-	14	-	14	-	-
3. Cattle Guards	1	-	1	-	-	1	-	1	-	-	19	-	19	-	-	19	-	19	-	-
4. Pack & Stock Trails	-	-	-	-	-	-	-	-	-	-	11	-	6	5	4	4	3	9	2	-
5. Truck Trails (Access Roads)	-	-	-	-	-	-	-	-	-	-	16	-	12	4	-	16	-	14	2	-
Totals	51	4	47	-	4	47	-	31	20	-	284	76	167	41	139	125	20	224	59	1

Table IV C. Effects of Projects Completed in S&M Project Areas Within Grazing Districts on Soils, Vegetation, and Management Values, Region III.

Kind of Project	MONTANA										WYOMING									
	Total Project Evaluated	Soils Value			Vegetation Value			Management Value			Total Project Evaluated	Soils Value			Vegetation Value			Management Value		
		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse
Vegetative Control & Protection Group																				
1. Brush & Weed Control	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	-	-	1	-	-
2. Pest Control	5	5	-	-	5	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	2	1	1	-	1	1	-	1	1	-	28	15	13	-	15	13	-	2	26	-
4. Tree Planting	-	-	-	-	-	-	-	-	-	-	2	2	-	-	1	1	-	-	2	-
5. Fire Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	16	16	-	-	16	-	-	16	-	-	16	15	1	-	15	1	-	15	1	-
7. Check Plots	1	1	-	-	1	-	-	-	1	-	8	8	-	-	8	-	-	-	8	-
Water Control Group																				
1. Canals & Ditches	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	-	-	1	-	-
2. Contouring	2	2	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	6	6	-	-	6	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-
5. Checks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	185	171	13	1	171	13	1	171	13	1	264	250	14	-	224	40	-	229	35	-
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Springs	19	18	1	-	18	1	-	18	1	-	17	17	-	-	17	-	-	17	-	-
11. Wells	7	5	2	-	5	2	-	5	2	-	9	4	5	-	4	5	-	4	5	-
12. Pipelines	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group																				
1. Bridges	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	5	5	-	-	5	-	-	5	-	-	4	4	-	-	4	-	-	4	-	-
3. Cattle Guards	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Pack & Stock Trails	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Truck Trails (Access Roads)	-	-	-	-	-	-	-	-	-	-	5	5	-	-	5	-	-	5	-	-
Totals	248	230	17	1	230	17	1	229	18	1	355	322	33	-	295	60	-	278	77	-

Table IV D. Effects of Projects Completed in S&M Project Areas Within Grazing Districts on Soils, Vegetation, and Management Values, Region IV.

Kind of Project	COLORADO										UTAH									
	Total Project Evaluated	Soils Value			Vegetation Value			Management Value			Total Project Evaluated	Soils Value			Vegetation Value			Management Value		
		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse
Vegetative Control & Protection Group																				
1. Brush & Weed Control	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Pest Control	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	47	29	18	-	30	17	-	27	19	1	22	16	4	2	16	4	2	19	2	1
4. Tree Planting	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Fire Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	-	-	-	-	-	-	-	-	-	-	22	20	2	-	21	1	-	20	2	-
7. Check Plots	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Control Group																				
1. Canals & Ditches	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Contouring	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Checks	-	-	-	-	-	-	-	-	-	-	11	11	-	-	11	-	-	11	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	90	41	49	-	45	45	-	51	39	-	59	48	11	-	40	18	1	51	8	-
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Springs	68	3	64	1	57	11	-	57	10	1	21	17	3	1	16	4	1	19	2	-
11. Wells	4	2	2	-	4	-	-	4	-	-	9	5	1	3	5	1	3	6	-	3
12. Pipelines	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group																				
1. Bridges	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Cattle Guards	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Pack & Stock Trails	-	-	-	-	-	-	-	-	-	-	3	3	-	-	3	-	-	3	-	-
5. Truck Trails (Access Roads)	-	-	-	-	-	-	-	-	-	-	8	8	-	-	8	-	-	8	-	-
Totals	209	75	133	1	136	73	-	139	68	2	155	128	21	6	120	28	7	137	14	4

Table IV E. Effects of Projects Completed in S&M Project Areas Within Grazing Districts on Soils, Vegetation, and Management Values, Region V.

Kind of Project	ARIZONA										NEW MEXICO									
	Total Project Evaluated	Soils Value			Vegetation Value			Management Value			Total Project Evaluated	Soils Value			Vegetation Value			Management Value		
		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse		Helpful	No Effect	Adverse	Helpful	No Effect	Adverse	Helpful	No Effect	Adverse
Vegetative Control & Protection Group																				
1. Brush & Weed Control	1	-	1	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
2. Pest Control	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	12	2	8	2	3	9	-	2	10	-	4	-	4	-	-	4	-	-	4	-
4. Tree Planting	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	1	-	-	1	-
5. Fire Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	89	69	20	-	84	5	-	89	-	-	78	68	10	-	70	8	-	78	-	-
7. Check Plots	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Control Group																				
1. Canals & Ditches	-	-	-	-	-	-	-	-	-	-	3	3	-	-	3	-	-	3	-	-
2. Contouring	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	-	-	1	-	-
4. Water Spreading	-	-	-	-	-	-	-	-	-	-	2	2	-	-	1	1	-	1	1	-
5. Checks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	12	11	1	-	12	-	-	9	3	-	61	46	14	1	53	8	-	61	-	-
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Springs	9	6	3	-	7	2	-	7	2	-	4	4	-	-	4	-	-	4	-	-
11. Wells	10	9	1	-	9	1	-	9	1	-	36	30	5	1	32	4	-	34	2	-
12. Pipelines	-	-	-	-	-	-	-	-	-	-	2	1	1	-	1	1	-	2	-	-
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	-	-	1	-	-
Range Use Facilitating Group																				
1. Bridges	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	5	4	1	-	4	1	-	5	-	-	1	-	1	-	-	1	-	1	-	-
3. Cattle Guards	10	-	10	-	-	10	-	10	-	-	18	8	10	-	10	8	-	18	-	-
4. Pack & Stock Trails	1	1	-	-	1	-	-	1	-	-	2	1	1	-	2	-	-	2	-	-
5. Truck Trails (Access Roads)	2	1	1	-	1	1	-	2	-	-	4	1	3	-	1	3	-	4	-	-
Totals	151	103	46	2	122	29	-	135	16	-	218	166	50	2	179	39	-	210	8	-

Table V. Numbers of Inferior Projects in S&M Areas Within Grazing Districts, Grouped by Causes of Inferior Effects or Conditions, by Regions.

Kind of Project	SUMMARY ALL PROJECTS							REGION I							REGION II							REGION III							REGION IV							REGION V						
	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other
Vegetative Control & Protection Group																																										
1. Brush & Weed Control	1	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Pest Control	3	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	125	19	36	-	14	14	42	24	-	10	-	3	1	10	33	11	6	-	7	6	3	28	5	9	-	-	-	14	26	5	11	-	3	7	-	16	-	-	-	1	-	15
4. Tree Planting	2	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	1
5. Fire Protection	3	-	2	-	-	1	-	3	-	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	73	2	1	13	25	21	11	31	-	1	3	5	21	1	8	-	-	-	8	-	-	10	1	-	8	-	-	1	3	1	-	1	1	-	-	21	-	-	1	11	-	9
7. Check Plots	1	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Control Group																																										
1. Canals & Ditches	3	-	-	1	-	2	-	2	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-
2. Contouring	1	-	-	-	-	-	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	3	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-
5. Checks	2	-	2	-	-	-	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	238	82	33	35	35	27	26	62	10	14	3	20	3	12	21	4	5	3	2	4	3	70	41	1	22	1	-	5	68	27	11	7	2	20	1	17	-	2	-	10	-	5
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Springs	166	4	19	42	47	36	18	91	1	15	2	37	28	8	23	1	1	5	7	7	2	22	2	-	20	-	-	-	20	-	2	14	3	1	-	10	-	1	1	-	-	8
11. Wells	49	2	1	3	30	3	10	4	-	-	1	1	1	1	29	-	1	-	27	-	1	4	1	-	1	-	-	2	3	1	-	-	-	2	-	9	-	-	1	2	-	6
12. Pipelines	3	-	-	1	-	1	1	-	-	-	-	-	-	-	3	-	-	1	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group																																										
1. Bridges	1	-	-	-	1	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	8	-	-	6	-	1	1	2	-	-	1	-	1	-	-	-	-	-	-	-	-	6	-	-	5	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Cattle Guards	35	-	5	10	-	20	-	28	-	5	3	-	20	-	6	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-
4. Pack & Stock Trails	12	-	2	4	6	-	-	1	-	-	1	-	-	-	9	-	2	1	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2	-	-	-
5. Truck Trails (Access Roads)	25	3	-	5	2	15	-	16	-	-	2	-	14	-	4	1	-	-	2	1	-	3	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	754	112	101	126	161	141	113	268	11	49	16	67	92	33	138	17	15	16	60	19	11	149	50	10	64	1	-	24	120	34	24	22	9	30	1	79	-	3	8	24	-	44

Table V A. Numbers of Inferior Projects in S&M Areas Within Grazing Districts, Grouped by Causes of Inferior Effects or Conditions, Region I.

Kind of Project	IDAHO							OREGON						
	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other
Vegetative Control & Protection Group														
1. Brush & Weed Control	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Pest Control	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	16	-	5	-	1	-	10	8	-	5	-	2	1	-
4. Tree Planting	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Fire Protection	3	-	2	-	-	1	-	-	-	-	-	-	-	-
6. Fencing	10	-	-	-	-	10	-	21	-	1	3	5	11	1
7. Check Plots	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Control Group														
1. Canals & Ditches	-	-	-	-	-	-	-	2	-	-	-	-	2	-
2. Contouring	1	-	-	-	-	-	1	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Checks	2	-	2	-	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	22	10	1	3	4	-	4	40	-	13	-	16	3	8
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Springs	35	-	5	1	13	15	1	56	1	10	1	24	13	7
11. Wells	2	-	-	-	1	1	-	2	-	-	1	-	-	1
12. Pipelines	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group														
1. Bridges	1	-	-	-	1	-	-	-	-	-	-	-	-	-
2. Corrals	1	-	-	1	-	-	-	1	-	-	-	-	1	-
3. Cattle Guards	10	-	4	1	-	5	-	18	-	1	2	-	15	-
4. Pack & Stock Trails	1	-	-	1	-	-	-	-	-	-	-	-	-	-
5. Truck Trails (Access Roads)	2	-	-	1	-	1	-	14	-	-	1	-	13	-
Totals	106	10	19	8	20	33	16	162	1	30	8	47	59	17

Table V B. Numbers of Inferior Projects in S&M Areas Within Grazing Districts, Grouped by Causes of Inferior Effects or Conditions, Region II.

Kind of Project	CALIFORNIA							NEVADA						
	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other
Vegetative Control & Protection Group														
1. Brush & Weed Control	-	-	-	-	-	-	-	1	-	-	-	1	-	-
2. Pest Control	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	2	-	1	-	-	-	1	31	11	5	-	7	6	2
4. Tree Planting	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Fire Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	-	-	-	-	-	-	-	8	-	-	-	8	-	-
7. Check Plots	-	-	-	-	-	-	-	1	-	-	-	-	-	1
Water Control Group														
1. Canals & Ditches	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Contouring	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Checks	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	2	-	1	1	-	-	-	19	4	4	2	2	4	3
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Springs	-	-	-	-	-	-	-	23	1	1	5	7	7	2
11. Wells	3	-	1	-	2	-	-	26	-	-	-	25	-	1
12. Pipelines	-	-	-	-	-	-	-	3	-	-	1	-	1	1
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group														
1. Bridges	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Cattle Guards	-	-	-	-	-	-	-	6	-	-	6	-	-	-
4. Pack & Stock Trails	-	-	-	-	-	-	-	9	-	2	1	6	-	-
5. Truck Trails (Access Roads)	-	-	-	-	-	-	-	4	1	-	-	2	1	-
Totals	7	-	3	1	2	-	1	131	17	12	15	58	19	10

Table V C. Numbers of Inferior Projects in S&M Areas Within Grazing Districts, Grouped by Causes of Inferior Effects or Conditions, Region III.

Kind of Project	MONTANA							WYOMING						
	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other
Vegetative Control & Protection Group														
1. Brush & Weed Control	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Pest Control	3	-	-	3	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	1	-	-	-	-	-	1	27	5	9	-	-	-	13
4. Tree Planting	-	-	-	-	-	-	-	1	-	-	-	-	-	1
5. Fire Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	7	-	-	7	-	-	-	3	1	-	1	-	-	1
7. Check Plots	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Control Group														
1. Canals & Ditches	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Contouring	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	2	-	-	2	-	-	-	-	-	-	-	-	-	-
5. Checks	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	29	11	-	13	1	-	4	41	30	1	9	-	-	1
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Springs	10	2	-	8	-	-	-	12	-	-	12	-	-	-
11. Wells	2	-	-	-	-	-	2	2	1	-	1	-	-	-
12. Pipelines	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group														
1. Bridges	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	5	-	-	5	-	-	-	1	-	-	-	-	-	1
3. Cattle Guards	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Pack & Stock Trails	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Truck Trails (Access Roads)	-	-	-	-	-	-	-	3	-	-	3	-	-	-
Totals	59	13	-	38	1	-	7	90	37	10	26	-	-	17

Table V D. Numbers of Inferior Projects in S&M Areas Within Grazing Districts, Grouped by Causes of Inferior Effects or Conditions, Region IV.

Kind of Project	COLORADO							UTAH						
	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other
Vegetative Control & Protection Group														
1. Brush & Weed Control	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Pest Control	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	19	4	10	-	2	3	-	7	1	1	-	1	4	-
4. Tree Planting	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Fire Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	-	-	-	-	-	-	-	3	1	-	1	1	-	-
7. Check Plots	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Control Group														
1. Canals & Ditches	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Contouring	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Checks	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	58	25	11	7	2	12	1	10	2	-	-	-	8	-
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Springs	18	-	2	14	1	1	-	2	-	-	-	2	-	-
11. Wells	-	-	-	-	-	-	-	3	1	-	-	-	2	-
12. Pipelines	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group														
1. Bridges	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Cattle Guards	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Pack & Stock Trails	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Truck Trails (Access Roads)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	95	29	23	21	5	16	1	25	5	1	1	4	14	-

Table V E. Numbers of Inferior Projects in S&M Areas Within Grazing Districts, Grouped by Causes of Inferior Effects or Conditions, Region V.

Kind of Project	ARIZONA							NEW MEXICO						
	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other	All Causes	Inadequate Planning	Inadequate Structure & Method	Inadequate Maintenance	Improper Use	Normal Deterioration	Other
Vegetative Control & Protection Group														
1. Brush & Weed Control	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Pest Control	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	12	-	-	-	1	-	11	4	-	-	-	-	-	4
4. Tree Planting	-	-	-	-	-	-	-	1	-	-	-	-	-	1
5. Fire Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	11	-	-	1	1	-	9	10	-	-	-	10	-	-
7. Check Plots	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Control Group														
1. Canals & Ditches	-	-	-	-	-	-	-	1	-	-	1	-	-	-
2. Contouring	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	-	-	-	-	-	-	-	1	-	-	1	-	-	-
5. Checks	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	5	-	1	-	-	-	4	12	-	1	-	10	-	1
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Springs	5	-	1	-	-	-	4	5	-	-	1	-	-	4
11. Wells	2	-	-	-	-	-	2	7	-	-	1	2	-	4
12. Pipelines	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group														
1. Bridges	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Cattle Guards	-	-	-	-	-	-	-	1	-	-	1	-	-	-
4. Pack & Stock Trails	-	-	-	-	-	-	-	2	-	-	2	-	-	-
5. Truck Trails (Access Roads)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	35	-	2	1	2	-	30	44	-	1	7	22	-	14

Table VI. Numbers of Projects in S&M Areas Within Grazing Districts, Grouped by Treatment Needed, by Regions.

Kind of Project	SUMMARY ALL PROJECTS						REGION 1						REGION 11						REGION 111						REGION IV						REGION V					
	All Treatments	Normal Maintenance	Develop Further	Reconstruct or Repeat	Salvage For Other Use	Abandon	All Treatments	Normal Maintenance	Develop Further	Reconstruct or Repeat	Salvage For Other Use	Abandon	All Treatments	Normal Maintenance	Develop Further	Reconstruct or Repeat	Salvage For Other Use	Abandon	All Treatments	Normal Maintenance	Develop Further	Reconstruct or Repeat	Salvage For Other Use	Abandon	All Treatments	Normal Maintenance	Develop Further	Reconstruct or Repeat	Salvage For Other Use	Abandon	All Treatments	Normal Maintenance	Develop Further	Reconstruct or Repeat	Salvage For Other Use	Abandon
Vegetative Control & Protection Group																																				
1. Brush & Weed Control	9	8	-	1	-	-	1	1	-	-	-	-	6	5	-	1	-	-	1	1	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
2. Pest Control	9	3	-	6	-	-	3	-	-	3	-	-	-	-	-	-	-	-	5	2	-	3	-	-	1	1	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	193	110	8	36	-	39	44	25	-	10	-	9	34	11	7	5	-	11	30	16	-	1	-	13	69	45	1	18	-	5	16	13	-	2	-	1
4. Tree Planting	3	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-
5. Fire Protection	5	5	-	-	-	-	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	395	387	1	4	3	-	126	119	1	4	2	-	48	48	-	-	-	-	32	31	-	-	1	-	22	22	-	-	-	-	167	167	-	-	-	-
7. Check Plots	5	5	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Control Group																																				
1. Canals & Ditches	7	7	-	-	-	-	3	3	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	3	3	-	-	-	-
2. Contouring	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
4. Water Spreading	10	10	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	6	6	-	-	-	-	-	-	-	-	-	-	3	3	-	-	-	-
5. Checks	5	5	-	-	-	-	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
8. Dams - Retention	978	874	40	35	6	23	250	210	28	7	-	5	78	58	2	14	-	4	428	390	10	14	-	14	149	143	-	-	6	-	73	73	-	-	-	-
9. Streambank Protection	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-
10. Springs	324	272	-	46	-	6	136	101	-	32	-	3	49	40	-	7	-	2	37	32	-	4	-	1	89	86	-	3	-	-	13	13	-	-	-	-
11. Wells	144	134	-	1	-	9	7	6	-	1	-	-	58	56	-	-	-	2	20	17	-	-	-	3	13	11	-	-	-	2	46	44	-	-	-	2
12. Pipelines	12	11	-	-	-	1	4	4	-	-	-	-	6	5	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-
13. Storage Tanks	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
Range Use Facilitating Group																																				
1. Bridges	3	3	-	-	-	-	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	44	42	-	1	-	1	15	14	-	1	-	-	15	15	-	-	-	-	9	8	-	-	-	1	-	-	-	-	-	-	5	5	-	-	-	-
3. Cattle Guards	123	113	-	6	-	4	74	64	-	6	-	4	20	20	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	28	28	-	-	-	-
4. Pack & Stock Trails	20	19	-	1	-	-	3	2	-	1	-	-	11	11	-	-	-	-	-	-	-	-	-	-	3	3	-	-	-	-	3	3	-	-	-	-
5. Truck Trails (Access Roads)	76	72	-	2	-	2	42	40	-	2	-	-	16	14	-	-	-	2	5	5	-	-	-	-	7	7	-	-	-	-	6	6	-	-	-	-
Totals	2,374	2,091	49	140	9	85	721	602	29	67	2	21	343	285	9	27	-	22	584	519	10	22	1	32	356	321	1	21	6	7	370	364	-	3	-	3

Table VI A. Numbers of Projects in S&M Areas Within Grazing Districts, Grouped by Treatment Needed, Region I.

Kind of Project	IDAHO						OREGON					
	All Treatments	Normal Maintenance	Develop Further	Reconstruct or Repeat	Salvage For Other Use	Abandon	All Treatments	Normal Maintenance	Develop Further	Reconstruct or Repeat	Salvage For Other Use	Abandon
Vegetative Control & Protection Group												
1. Brush & Weed Control	1	1	-	-	-	-	-	-	-	-	-	-
2. Pest Control	-	-	-	-	-	-	3	-	-	3	-	-
3. Seeding & Planting	28	17	-	4	-	7	16	8	-	6	-	2
4. Tree Planting	-	-	-	-	-	-	-	-	-	-	-	-
5. Fire Protection	5	5	-	-	-	-	-	-	-	-	-	-
6. Fencing	51	49	-	-	2	-	75	70	1	4	-	-
7. Check Plots	-	-	-	-	-	-	-	-	-	-	-	-
Water Control Group												
1. Canals & Ditches	3	3	-	-	-	-	-	-	-	-	-	-
2. Contouring	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	1	1	-	-	-	-	-	-	-	-	-	-
5. Checks	4	4	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	114	95	15	2	-	2	136	115	13	5	-	3
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-
10. Springs	89	84	-	5	-	-	47	17	-	27	-	3
11. Wells	3	3	-	-	-	-	4	3	-	1	-	-
12. Pipelines	3	3	-	-	-	-	1	1	-	-	-	-
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group												
1. Bridges	3	3	-	-	-	-	-	-	-	-	-	-
2. Corrals	10	9	-	1	-	-	5	5	-	-	-	-
3. Cattle Guards	24	19	-	3	-	2	50	45	-	3	-	2
4. Pack & Stock Trails	3	2	-	1	-	-	-	-	-	-	-	-
5. Truck Trails (Access Roads)	22	21	-	1	-	-	20	19	-	1	-	-
Totals	364	319	15	17	2	11	357	283	14	50	-	10

Table VI B. Numbers of Projects in S&M Areas Within Grazing Districts, Grouped by Treatment Needed, Region II.

Kind of Project	CALIFORNIA						NEVADA					
	All Treatments	Normal Maintenance	Develop Further	Reconstruct or Repeat	Salvage For Other Use	Abandon	All Treatments	Normal Maintenance	Develop Further	Reconstruct or Repeat	Salvage For Other Use	Abandon
Vegetative Control & Protection Group												
1. Brush & Weed Control	-	-	-	-	-	-	6	5	-	1	-	-
2. Pest Control	-	-	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	2	1	-	-	-	1	32	10	7	5	-	10
4. Tree Planting	-	-	-	-	-	-	-	-	-	-	-	-
5. Fire Protection	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	4	4	-	-	-	-	44	44	-	-	-	-
7. Check Plots	-	-	-	-	-	-	2	2	-	-	-	-
Water Control Group												
1. Canals & Ditches	-	-	-	-	-	-	-	-	-	-	-	-
2. Contouring	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	-	-	-	-	-	-	-	-	-	-	-	-
5. Checks	-	-	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	32	32	-	-	-	-	46	26	2	14	-	4
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-
10. Springs	4	4	-	-	-	-	45	36	-	7	-	2
11. Wells	8	8	-	-	-	-	50	48	-	-	-	2
12. Pipelines	-	-	-	-	-	-	6	5	-	-	-	1
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group												
1. Bridges	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	-	-	-	-	-	-	15	15	-	-	-	-
3. Cattle Guards	1	1	-	-	-	-	19	19	-	-	-	-
4. Pack & Stock Trails	-	-	-	-	-	-	11	11	-	-	-	-
5. Truck Trails (Access Roads)	-	-	-	-	-	-	16	14	-	-	-	2
Totals	51	50	-	-	-	1	292	235	9	27	-	21

Table VI D. Numbers of Projects in S&M Areas Within Grazing Districts, Grouped by Treatment Needed, Region IV.

Kind of Project	COLORADO						UTAH					
	All Treatments	Normal Maintenance	Develop Further	Reconstruct or Repeat	Salvage For Other Use	Abandon	All Treatments	Normal Maintenance	Develop Further	Reconstruct or Repeat	Salvage For Other Use	Abandon
Vegetative Control & Protection Group												
1. Brush & Weed Control	-	-	-	-	-	-	-	-	-	-	-	-
2. Pest Control	-	-	-	-	-	-	1	1	-	-	-	-
3. Seeding & Planting	47	29	1	14	-	3	22	16	-	4	-	2
4. Tree Planting	-	-	-	-	-	-	-	-	-	-	-	-
5. Fire Protection	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	-	-	-	-	-	-	22	22	-	-	-	-
7. Check Plots	-	-	-	-	-	-	-	-	-	-	-	-
Water Control Group												
1. Canals & Ditches	-	-	-	-	-	-	-	-	-	-	-	-
2. Contouring	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	-	-	-	-	-	-
4. Water Spreading	-	-	-	-	-	-	-	-	-	-	-	-
5. Checks	-	-	-	-	-	-	1	1	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	-	-	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	90	90	-	-	-	-	59	53	-	-	6	-
9. Streambank Protection	-	-	-	-	-	-	1	1	-	-	-	-
10. Springs	68	65	-	3	-	-	21	21	-	-	-	-
11. Wells	4	4	-	-	-	-	9	7	-	-	-	2
12. Pipelines	-	-	-	-	-	-	-	-	-	-	-	-
13. Storage Tanks	-	-	-	-	-	-	-	-	-	-	-	-
Range Use Facilitating Group												
1. Bridges	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	-	-	-	-	-	-	-	-	-	-	-	-
3. Cattle Guards	-	-	-	-	-	-	1	1	-	-	-	-
4. Pack & Stock Trails	-	-	-	-	-	-	3	3	-	-	-	-
5. Truck Trails (Access Roads)	-	-	-	-	-	-	7	7	-	-	-	-
Totals	209	188	1	17	-	3	147	133	-	4	6	4

Table VI E. Numbers of Projects in S&M Areas Within Grazing Districts, Grouped by Treatment Needed, Region V.

Kind of Project	ARIZONA						NEW MEXICO					
	All Treatments	Normal Maintenance	Develop Further	Reconstruct or Repeat	Salvage For Other Use	Abandon	All Treatments	Normal Maintenance	Develop Further	Reconstruct or Repeat	Salvage For Other Use	Abandon
Vegetative Control & Protection Group												
1. Brush & Weed Control	1	1	-	-	-	-	-	-	-	-	-	-
2. Pest Control	-	-	-	-	-	-	-	-	-	-	-	-
3. Seeding & Planting	12	12	-	-	-	-	4	1	-	2	-	1
4. Tree Planting	-	-	-	-	-	-	1	-	-	1	-	-
5. Fire Protection	-	-	-	-	-	-	-	-	-	-	-	-
6. Fencing	89	89	-	-	-	-	78	78	-	-	-	-
7. Check Plots	-	-	-	-	-	-	-	-	-	-	-	-
Water Control Group												
1. Canals & Ditches	-	-	-	-	-	-	3	3	-	-	-	-
2. Contouring	-	-	-	-	-	-	-	-	-	-	-	-
3. Diking	-	-	-	-	-	-	1	1	-	-	-	-
4. Water Spreading	-	-	-	-	-	-	3	3	-	-	-	-
5. Checks	-	-	-	-	-	-	-	-	-	-	-	-
6. Dams - Detention	-	-	-	-	-	-	1	1	-	-	-	-
7. Dams - Diversion	-	-	-	-	-	-	-	-	-	-	-	-
8. Dams - Retention	12	12	-	-	-	-	61	61	-	-	-	-
9. Streambank Protection	-	-	-	-	-	-	-	-	-	-	-	-
10. Springs	9	9	-	-	-	-	4	4	-	-	-	-
11. Wells	10	9	-	-	-	1	36	35	-	-	-	1
12. Pipelines	-	-	-	-	-	-	2	2	-	-	-	-
13. Storage Tanks	-	-	-	-	-	-	1	1	-	-	-	-
Range Use Facilitating Group												
1. Bridges	-	-	-	-	-	-	-	-	-	-	-	-
2. Corrals	4	4	-	-	-	-	1	1	-	-	-	-
3. Cattle Guards	10	10	-	-	-	-	18	18	-	-	-	-
4. Pack & Stock Trails	1	1	-	-	-	-	2	2	-	-	-	-
5. Truck Trails (Access Roads)	2	2	-	-	-	-	4	4	-	-	-	-
Totals	150	149	-	-	-	1	220	215	-	3	-	2

OLD FORM
Revised Form Submitted

DEPARTMENT OF THE INTERIOR
Bureau of Land Management

PROJECT INSPECTION REPORT

Region No. . . . . .
Grazing Dist. No. . .
County . . . . . .
S&M Area No. . . . .
Project No. . . . . .

Project Name . . . . . .

1. Type of project:

2. Location of project by legal subdivision:

3. Maintenance agreement? Yes , No .

4. Describe condition of project, giving reasons for depreciation or failure:

If project failed and is abandoned has Form 1-519 been processed?

5. Describe condition of vegetation, soil, and erosion on land tributary to project:

6. Describe influence of project on above conditions, and remedial action, if any, recommended:

7. If repairs are needed, list estimate of materials, labor, equipment costs and total costs:

8. Remarks (Include pertinent or unusual facts not covered above):

9. Were report and recommendations discussed with administration?

10. Support report with photographs.

Date of inspection . . . . . Made by . . . . . .
(Name)
. . . . . .
(Title)

Prepare in triplicate: 1 copy to: District, Region, Office of Director.

OLD FORM
Revised Form Submitted

DEPARTMENT OF THE INTERIOR
Bureau of Land Management

APPRAISAL OF RESEEDING OPERATIONS

Region No. . . . . .
Grazing Dist. No. . . .
County . . . . . .
S&M Are No. . . . . .
Project No. . . . . .

Project Name . . . . . .

Refer to Reseeding Operations Report Dated . . . . .

1. Vegetation (List dominant species):

   Density : % shrubs; % herbaceous plants; % seed species.

   Grazing capacity acres per AUM.

2. Discuss results of reseeding, reasons therefore, and changes in methods, species seeded, etc., recommended:

3. Describe current erosion conditions and influence of reseeding operations:

4. Are grazing resources being maintained in thrifty, productive condition under current utilization? Explain:

5. Remarks: (Include changes in management practices recommended and reasons therefor):

6. Have findings and recommendations been discussed with administration?

7. Support report with photographs.

Date of Inspection . . . . . Made by . . . . . .
(Name)

. . . . . .
(Title)

Prepare in triplicate: 1 copy to: District, Region, Office of Director

OLD FORM
Revised Form Submitted

DEPARTMENT OF THE INTERIOR
Bureau of Land Management

RESEEDING OPERATIONS REPORT

Region No. . . . . .
Grazing Dist. No. . .
County . . . . . .
S&M Area No. . . . . .
Project No. . . . . .

Project Name . . . . . .

1. Location by legal subdivisions:

2. Site description:
   Soil type and texture:

   Average annual precipitation inches: Seasonal distribution:

   Topography and slope:

   Vegetation (List dominant species), condition, thrift:

   Density : % shrubs; % herbaceous plants.

   Grazing capacity acres per AUM.

3. Describe erosion conditions:

4. Describe history of grazing use as related to current range and erosion conditions:

5. Describe current management, degree of utilization:

6. Date reseeding started, : Completed, .

7. Acres reseeded, : Rate of seeding, lbs. per acre, .

8. Seed used: Specie , % of mixture; Specie ,
   % of mixture; Specie , % of mixture.

9. Costs: Seed $, Labor $, Equipment $, Other $.
   Total Cost $, Cost per acre $.

10. Describe soil moisture conditions at time of seeding, and subsequent precipitation:

11. Seeding method used (Concise Narrative):

12. Brush removal (Describe method and percentage of kill):

13. Is reseeded area adequately marked?

14. Describe provision made for protection:

15. Remarks (Record any pertinent or unusual facts not covered above):

16. Support report with photographs.

Date of examination . . . . . Made by . . . . . .
(Name)

. . . . . .
(Title)

Prepare in triplicate: 1 copy to: District, Region, Office of Director.

(Use additional sheets if necessary)

OLD FORM
No Revision Suggested

DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Outline for Reporting Appraisal of Soil and Moisture Operations on S&M Project Areas

Region No. . . . .
Graz. Dist. No. .
County . . . . . .
S&M Area No. . . .

Project Area Name . . . . . .

1. Land status: Acreage of public land, ; private, ; and State .

2. Project inventory (From District Grazier's Project Records):

Completed S&M projects from date of approval of area to (date of examination).
Reseeding acres; Reservoirs number; Wells number;
Springs number; Fences miles; Other .

Projects completed other than S&M to (date of examination).
Reseeding acres; Reservoirs number; Wells number;
Springs number; Fences miles; Other .

3. Describe briefly the project work accomplished as to standards, distribution over area, and with relation to depleted land and land where erosion was or is active.

4. Describe erosion conditions in area as a whole as to type and degree.

5. Describe effectiveness in general of completed projects on erosion.

6. Describe the vegetation as to type, condition, and current utilization including suggestions for changes in current management practices that the condition of the range indicates to be necessary.

7. Describe the addit onal projects that are needed to bring about the rehabilitation of depleted ranges and the curtailment and prevention of erosion.

8. Indicate the change in the original project program that the above program will entail.

9. Discuss past cooperation, and possibilities of future cooperation from permittees, advisory boards, and State or other conservation districts, in connection with the soil and moisture activities within this area.

10. Indicate the reaction of the District Grazier to your appraisal of the situation in this area and to any changes that are proposed.

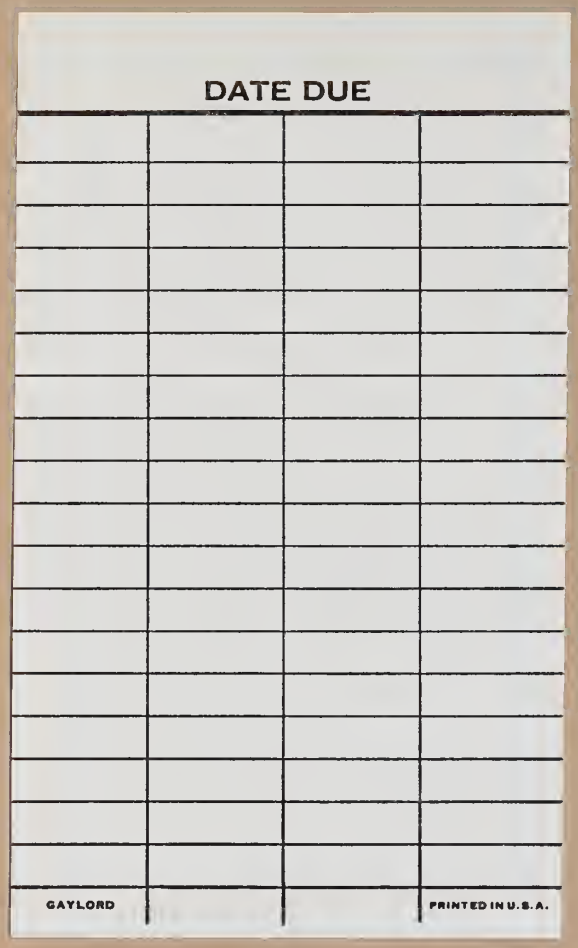
11. List the individual projects by project number that have been inspected and reported upon the appropriate forms, which are to be submitted with this report.

12. Indicate the priority that should attach to the conservation activities in this project area (a) on a district, and (b) on a region-wide basis; (1) urgent, (a) important, and (3) desirable.

Conclude report with name of author, title, and date.

Prepare in triplicate: 1 copy to: District, Region, and Office of Director.

57625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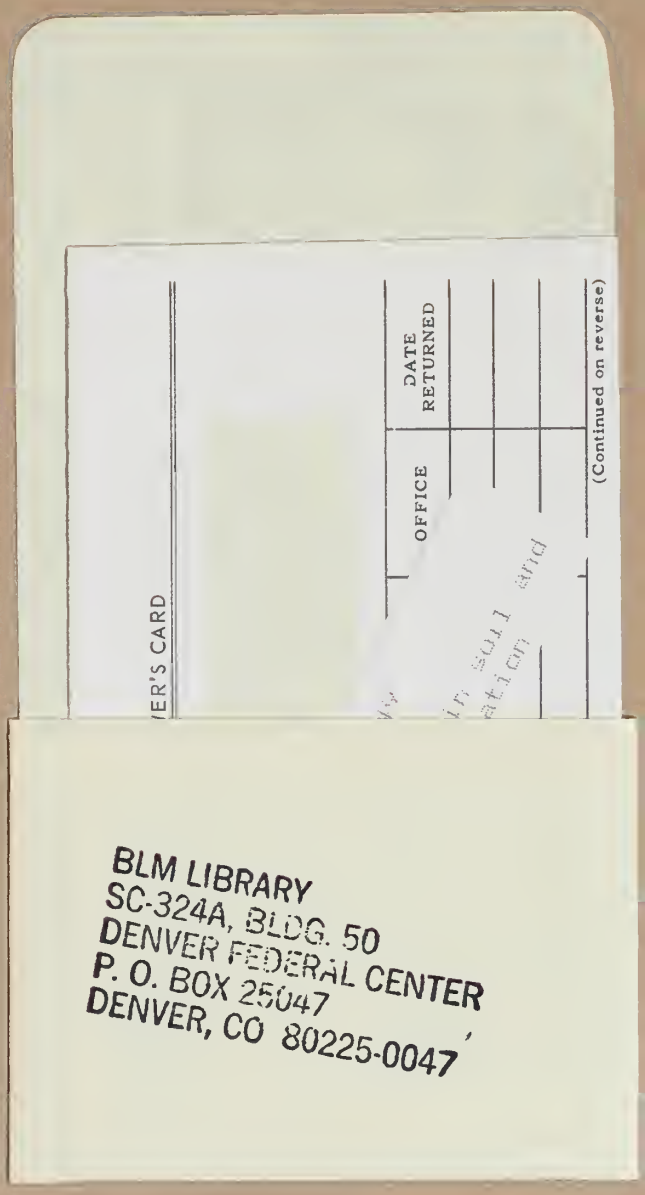
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